DOCUMENT RESUME

ED 388 636 SP 036 282

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TITLE Integrating Technology into Teacher Education at the American University.
PUB DATE [95]
NOTE 121p.
PUB TYPE Reports - Descriptive (141) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Computer Literacy; Computers; *Computer Uses in Education; *Curriculum Development; Elementary Secondary Education; Higher Education; Integrated Curriculum; Needs Assessment; *Preservice Teacher Education; *Teacher Education Curriculum; *Teaching Methods
IDENTIFIERS *American University DC; *Computer Integrated Instruction

ABSTRACT

This paper reports on a project to integrate technology into several courses in the teacher education program at the American University, District of Columbia. The project was divided into four phases. Phase 1 was a needs assessment, looking at the technological skills of current teacher education students. Phase 2 explored developing and implementing curricular changes and integrating computers into existing courses. Phase 3 examined dissemination of the results of the study through presentations and publications. Phase 4 focused on future plans for development, addressing issues such as gender equity and access for the disabled, advanced topics in programming, hardware configuration and maintenance, and the development and use of multi-media presentations. Appendices, comprising the bulk of the document, include a student questionnaire, class schedules and descriptions, sample lessons, a computer analysis checklist, course syllabi, a guide to education software, and a grant proposal for funding further study. (ND)

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ED 388 636

Integrating Technology into Teacher Education at The American University

Lynn H. Fox and Deborah Thompson[1]

Despite the increased availability of microcomputers and the proliferation of educational software computers in virtually every public school system in the nation, many teachers are not incorporating the technology into their lessons on a regular basis. According to the U.S. Office of Technology Assessment (1988), one of the major reasons for the limited impact of computers in schools is simply because most graduates of education programs have not been taught how to use them. Recognizing the need to better prepare future teachers, we began a project to integrate technology into several courses in the pre-service teacher education program in the spring of 1993. This was made possible by a curriculum development grant from the university. This report summarizes the process of developing the curricular goals and the methods used to implement them and concludes with a discussion of the needs and plans for the future.

The project was divided into the following four phases: Phase I - Needs assessment, Phase II - Curriculum development, Phase III - Dissemination and Phase IV - Plans for the future. These phases are briefly described in Table 1.

Insert Table 1 About Here

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[1]The authors wish to acknowledge the help of several others, especially in the planning process: Drs. Charles Tescon and Cielle Block in the School of Education and B.J. Gleason, an instructor in the Department of Computer Sciences and Information Sciences.

SP036282

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Phase I: Results of the Needs Assessment

The review of the literature suggested that there are the following four broad categories of computer use in the classroom: large group presentations and lessons; small group activities such as cooperative team simulations; learning stations for use by individual students or small groups; and clerical support for teachers. Some schools also have computer laboratories which may or may not be staffed by a computer teacher. At the secondary level these labs are primarily used for instruction in keyboarding and word processing (Becker 1991). In addition there are some teachers and schools which have acquired the hardware and software to support multi-media applications, but this is not as yet wide-spread.

With these general categories of uses of microcomputers in mind, we looked at the technology standards developed for teacher certification. The standards used by the National Association for State School Teacher Education Certification which we felt were the most relevant for our students are shown in Table 2.

Insert Table 2 About Here

Most of our pre-service students professed to have some basic word processing skills with **WordPerfect** being the software program most frequently mentioned. Approximately one-fifth had some exposure to spreadsheets. The program **Quattro Pro**, available to students in the computer labs on campus, was the most often cited. Some had played an educational computer game such as **Where in the World is Carmen Sandiego?**, but almost none knew

any programming languages. A copy of the student questionnaire is shown in Appendix A. The results of this survey suggest that in order for students to work with the educational applications of general software they would need some basic instruction in the use of the software itself. For example, the use of spreadsheets for record keeping and reporting grades would require students to learn how to use a spreadsheet. This could be incorporated directly in the teaching of the application or students could be required to take a non-credit course in spreadsheets through the University's computing center.

TAU has extensive computer resources, including an array of non-credit courses such as Introduction to **WordPerfect**, Introduction to **Quattro Pro**, and Introduction to **Paradox**. Classes in e-mail and advanced word processing are also offered. A description of facilities and the types of classes offered are shown in Appendix B.

After careful consideration we decided that it would be easier to have our classes meet in a computer laboratory classroom where there would be at least one machine for every two people than to try to demonstrate all the software in regular classrooms. For our purposes we selected the Anderson Computing Complex (ACC) which has both IBM compatible units and Macintosh computers. With these networked machines, students can access the university mainframe through which they can tap the library database, send e-mail, or run statistical software such as Statistical Package for the Social Sciences. **LCD** pads for use with overhead projectors are also available in ACC. Since the networked laboratory setup at Anderson Computer Complex supports site licenses as well as single station programs, we decided to purchase a variety of software for use there.

Phase II: Developing and implementing curricular changes

Wetzel (1993) suggests combining a core course in technology with the integration of technology across teacher education courses. A compelling reason to integrate technology across courses was that prospective teachers should have hands-on experiences within the context of their total teacher education program. Program constraints, however, influenced our decision not to require a core course. In the spring of 1995, an elective course in educational technology will be offered but it is not a required course in any of the teacher preparation strands: elementary, secondary or special education.

Since all education majors take "Psychology of Education" or "Theories of Educational Psychology" at the beginning of their programs, the general overview of computers in education and activities related to most objectives are presented in those classes. Some of the objectives are presented in greater depth in other classes. In Table 3 the objectives are mapped to specific courses with a brief description of the type of activity used to meet the objective. A sample lesson to teach students how easy it is to use spreadsheets for student record keeping is shown in Appendix C. The remaining goals are targeted in the methods courses. In these courses, students can meet the objectives in a variety of ways ranging from individual projects to cooperative group projects. They use various software programs in their development of written lesson plans and in micro-teaching demonstrations.

Insert Table 3 About Here

There were some objectives we consider so important that we incorporated them into

several classes. For example, we believe that pre-service teachers must become informed users of educational software, therefore in every class students must analyze and select appropriate software. In "Teaching Reading in Elementary Education", students are given a 30-item check list to analyze any of a number of popular reading/language arts programs available in ACC like **Reader Rabbit**, **Spell Bound**, and **Midnight Rescue**. (Software accompanying basal series are analyzed in a separate assignment.) The check list covers four major areas: educational value, user friendliness, capabilities, and safe guards. Students have to accept or reject the software based on their check list answers. A copy of the check list can be found in Appendix D.

In "Mathematics for Elementary School Teachers", one assignment combines objectives one, three and four in one cooperative learning activity. Four teams of students design lesson plans using various software packages. The first team focuses on selecting and using programs for drill and practice. The second team looks for problem-solving or simulation activities for small groups. A third team looks at programs that lend themselves to large group activities for mathematics instruction. A fourth team looks at programs in social studies or science to determine ways of integrating mathematical activities into lessons using those programs. Each team conducts a simulation lesson before fellow classmates who role play elementary students. Each team must address the question of how they would use their programs according to access, i.e., a one computer classroom versus a laboratory with multiple stations. Examples of course syllabi are shown in Appendix E.

Since the basic program tools for the clerical support for teaching were already available in Anderson Lab, we needed to purchase software that represented a wide spectrum of grade

levels, subject mater, and program style. We believed we needed a mix of very good programs that could be used to support whole language instruction and integrated mathematics and science teaching, especially at the elementary level. We choose two programs for which site licenses were purchased: **Oregon Trail**, and **Storybook Weaver**. Three other programs allowed up to five users at a time: **Math Rabbit**, **Reader Rabbit**, and **Decisions, Decisions** (an environmental science program for grades 4-8). Single copies of 20 other programs such as **Spellbound** and **Operation Neptune** were also added. Thus, we can do demonstrations of single programs using the **LCD** pad, have all students working with the same program such as Oregon Trail, or have individual or teams of students working with different software during a single class session. We also included a few programs that were not particularly good so that students could begin to appreciate the differences and the criteria for selecting software. For example, we have two different versions of a typing tutorial program. One that is very well done with games and practice exercises, tests and instruction and another program which is far less well developed. One program for teaching Spanish is included because it is very boring and basically more of a test maker that an instructional package. A handbook for students in which the educational software for grades pre-K through 12th grade in the Anderson Computer Lab is described is shown in Appendix F. This forms the core of software used in most class demonstrations.

Phase III: Dissemination

Dissemination has been two-fold: presentations and publications. In the fall of 1993, we submitted a proposal to the Society for Technology and Teacher Education Conference. The proposal entitled "Preparing Teachers for the 21st Century: Integrating Microcomputers into

the Teacher Education Curriculum" was accepted. A copy of the proposal can be found in Appendix G. A revised version of the proposal was converted into a paper and submitted to a STATE subcommittee. The paper was accepted and published in the conference proceedings. A copy of the paper is in Appendix H.

Currently, we are working on an a practical article that describes the interdisciplinary uses of The Oregon Trail, an interactive software program. A partial draft of the article, tentatively entitled "The Oregon Trail: An Interdisciplinary Gold Mine" can be found in Appendix I.

Phase IV: Plans for the Future

In the 1993-94 academic year, we have been developed lessons and activities and tried them out in the various courses we taught. By the end of 1994-95, we hope to have these activities and assignments fully integrated into the basic teacher education courses. We have already chosen a second set of objectives for future development. These are shown in Table 4. These objectives focus on issues such as gender equity and access for the disabled, advanced topics in programming, hardware configurations and maintenance, and the development and use of multi-media presentations. We hope to be able to eventually increase our library of resources and include some CD ROM materials such as Encarta, an encyclopedia. We have been fortunate to get some training in multi-media through seminars for faculty offered by CAS spring 1994. This has helped us see ways to start incorporating this into some of our own demonstrations.

Insert Table 4 about here

We believe we can accomplish more with our students if we can help them incorporate microcomputer technology into their practica and student teaching experience. This has been almost impossible to accomplish so far. One main barrier is that the teachers with whom our students are placed often do not use the technology themselves. Even when it is available we do not know in advance what software there will be in any given classroom. This makes it difficult to help our students plan lessons to incorporate the technology. One idea that occurred to us is to give our students lap-top computers and a mobile phone to take to their schools for practica and student teaching. They could access software from TAU, the internet, e-mail, and so forth. This would allow us to communicate with them more readily, and let them communicate with each other. We have written a proposal to Bell Atlantic for funding for this and the proposal is included in Appendix J of this document.

We believe micro-computers are tools that all prospective teachers need to be able to use with confidence. Computers are such an integral part of today's society that schools cannot afford to have them sit idle or be used infrequently. Universities must take the lead in research and teacher training. Technology must be incorporated into the teaching of the fundamentals of classroom management and instructional methods. We believe our approach at course-wide integration of behavioral and cognitive objectives in a systematic way is a fundamentally sound approach to making teacher training relevant and creative.

References

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U.S. Congress, Office of Technology Assessment. (1988). Power on! New tools for teaching and learning. Washington, DC: U.S. Government Printing Office.

Wetzel, K. (1993). Models for achieving computer competencies in pre-service education. Journal of Computing in Teacher Education. 9 (4), 4-6.

Table 1

The Four Phases of the Curriculum Development Project

Phase I: Needs Assessment

The primary task in this phase was to determine what we needed to teach. To accomplish this we reviewed the literature, analyzed the standards or benchmarks recommended by various educational accrediting and professional organizations, e.g. National Council for Accreditation of Teacher Education (NCATE) and National Council of Teacher of Mathematics (NCTM), and assessed student's levels of knowledge and experience at the entry level in educational programs. We also assessed the resources available to students and faculty on campus. These activities took place primarily in the late spring and summer of 1993. The survey of student skills is shown in Appendix A. University computer resources are shown in Appendix B. The results of the literature review culminated in the choice of objectives discussed in the description of the next phase.

Phase II: Curriculum Development and Implementation

Initially five goals were chosen and three more were added later. The meshing of the goals to specific activities was Complex. Class activities and student projects were assigned to one or more of six different courses. The work on this phase was begun in the summer of 1993 and continued through the present. Goals are shown in Table 2. Their assignment to courses are shown in Table 3. Samples of specific activities are shown in the Appendices C through F.

Phase III: Dissemination

A proposal for a presentation at the STATE 94 conference was submitted and accepted in the fall of 1993. A copy of the proposal is shown in Appendix G. The presentation was made in the winter of 1994 and a summary was published in the proceedings. This is shown in Appendix H. We are currently working on an article describing ways teachers can use computer software for cooperative learning and integrated curricular objectives at the elementary school level. A partial draft is shown in Appendix I.

Phase IV: Expansion and Plans for the Future

The plans for expansion have included efforts to seek additional funding for projects such as teaching student teachers to use e-mail and internet during their practicum and student teaching experiences. A copy of a proposal to the Bell Atlantic Foundation is shown in Appendix J. Additional goals to be incorporated in the future are shown in Table 4.

Table 2

Computer instructional objectives chosen to be integrated into various courses for undergraduate elementary education majors

Explore, evaluate and use computer/technology-based materials, including applications, educational software.

Demonstrate knowledge of uses of computers of problem solving, data collection, information management, communications, presentations, and decision making.

Design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and for diverse student populations.

Evaluate, select and integrate technology/computer-based instruction in the curriculum of one's subject area(s) and/or grade levels.

Demonstrate skill in using tools for professional and personal use, including word processing, database, utilities.

Demonstrate functional knowledge of telecommunications tools and resources such as e-mail and other internet functions.

Table 1

Computer Instructional Objectives/Assignments in Various Teacher Education Classes

	EDUCATION COURSES						
Objective	Psych. of Education 21. 320	Theories of Ed. Psych. 21 629	Math for Teachers 21 250	Children's Literature 21 319 & 21 619	Found. of Read. Instr. 21 371	SEM of Tch. Read. 21 555	SEM of Tch. L. Arts 21 551
Explore, evaluate and use computer software and technology based materials, including applications and computer software	Critique a variety of educational software	Critique a variety of educational software				Access available software using 10 item check sheet which covers areas ranging from user friendliness to strenghts and weaknesses for reading/language arts instruction.	Access available software using 10 item check sheet which covers areas ranging from user friendliness to strenghts and weaknesses for reading/language arts instruction.
Demonstrate knowledge of uses of the computers of problem solving, data collection, information management, communications, presentations and decision making	Develop hands on lesson on how to use spreadsheet for record keeping and reporting student progress	Develop hands on lesson on how to use spreadsheet for record keeping and reporting student progress					
Design and develop learning activities for settings and/or diverse student needs	Analyze ways to use different children's software packages	Analyze ways to use different children's software packages	Analyze ways to use different children's software packages		Develop inclusive lesson plan for one reading language arts related piece of software	Develop inclusive lesson plan for one reading language arts related piece of software	Develop inclusive lesson plan for one reading language arts related piece of software
Integrate computer based instruction in one's subject area/grade	Develop a lesson either alone or as a group project using the software	Develop a lesson either alone or as a group project using the software	Develop and teach a lesson either alone or as a group project using the software		See above	See above	See above

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Table 1 (cont'd)

Computer Instructional Objectives Assignments in Various Teacher Education Classes

	EDUCATION COURSES						
Objective	Psych. of Education 21.320	Theories of Ed. Psych. 21.629	Math for Teachers 21.250	Children's Literature 21.339 & 21.639	Found. of Read. Instr. 21.371	Meth of Tch. Read. 21.555	Meth of Tch. E. Arts 21.559
Demonstrate skill in using computer as a tool for graphics, word processing, etc.			Small group projects demonstrate to whole class on using graphics package or word processing package to develop worksheets, banners, etc.	Students use graphics or word processing package to develop literature units.		Students use word processing and clip art to construct text and pictures for big books.	Students use word processing and clip art to construct text and pictures student made books.
Demonstrate knowledge of telecommunications tools and resources such as e-mail and other internet functions.	Optional choice among several for individual learning projects.			Students subscribe to and participate in an internet user group that discusses children's literature issues e.g. KIDLIT & CHILDLIT	Students use [illegible] to research world-wide literacy issues.	Students use e-mail to communicate with teacher about assignments.	Students use e-mail to communicate with teacher about assignments.

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Table 4

Objectives Still to be Addressed

Demonstrate knowledge of equity, ethical, legal and human issues of computing and technology use as they relate to society and model appropriate behaviors.

Knowledge of configuration of computer hardware systems and basic troubleshooting and maintenance of hardware and software.

Functional knowledge of multimedia and hypermedia tools and resources.

APPENDIX A

Student Questionnaire

FALL 1994

Psychology of Education
Questionnaire

1.Name_____2. Phone_____

3. Student Status and Year and major(ex fulltime junior in elemetary education)

4. What is your career goal? If you are planning to teach, what age/grade group and subjects are you interested in teaching?
(Please share your reason for taking this course if you are not planning a career in education)

5. Please list other education and psychology courses you have taken and where

Courses	HS	AU	Other College

_____

6. Will you require any special accomodations for a learning disability or other condition? If yes, please explain

_____

7. Please check the name of software or software categories or related computer programs with which you are familiar and encircle the names of those to which you currently have access

__Wordperfect	__Other word processing	__Quatropro
__Lotus123	__Other spreadsheets	__Systat
__Mystat	__Other statistical	__Printshop
__Pagemaker	__PC Globe	__DBase
__Email	__Internet	__ERIC on Aladin
__Hypertext	__CD Rom Encyl, etc.	__Other educational software(list on back)

8. Briefly describe when and how you have learned to use the computer and various programs, please distinguish between learning formally and informally.

9. Briefly describe yourself as a student and your preferred learning style
(use the back of this page)

Theories of Educational Psychology
Spring 1994
Questionnaire

NAME_____Student Number_____

Contact by Phone_(Day)_____ (Evening)_____
In which program are you enrolled?

_____
What is your career goal? (If teaching is your goal specify grade level and subject areas.)

_____

Please list other courses you are taking this semester

_____

Please list other education and psychology courses you have taken and where

_____

_____

_____

Year of Graduation from College Bachelor's Degree Program_____

College attended_____Major_____

Current Employment(Specify if this is a full or parttime position)

_____

Please check the name of software or software categories or related computer programs with which you are familiar and encircle the names of those to which you currently have access

__Wordperfect	__Other word processing	__Quatropro
__Lotus123	__Other spreadsheets	__Systat
__Mystat	__Other statistical	__Printshop
__Pagemaker	__PC Globe	__DBase
__Email	__Internet	__ eric on aladin
__Hypertext	__CD Rom Encyl, etc.	__Other educational software(list on back)

Please describe briefly yourself as a student and your preferred or most successful learning style. If you have any special learning needs please explain. (USE THE BACK OF THIS PAGE)

APPENDIX B

Computer Facilities and Classes

To register for Faculty & Staff classes, CALL 202-885-2270.
For information about Student computer classes, CALL: Anderson at x2561, Hurst at x3862 or *McCabe* at x2829.

UNIVERSITY COMPUTING CENTER (UCC)
Faculty/Staff Personal Computer Training
Schedule of Classes
January - April 1994

The following information will help you determine the right classes for you to take based on your skills and experience with personal computers. All classes are *"hands on"* seminars taught in the Anderson Basement Computing Complex. Classes are in B-12, except where noted. (See attached map).

Class size will be limited to nineteen (19) people, except where noted. To guarantee your place in the class, please pre-register by calling the Computing Center at 885-2270 AND arrive promptly. As there are frequently standby people in the room, your pre-registered place will be lost if you are late. Please call 885-2270 to cancel your place in the class.

OPERATING SYSTEMS

Introduction to the Personal Computer and DOS 3.3 commands This is the first class to attend if you have never worked with a computer before, or if you need to understand more about essential DOS commands (format, diskcopy, dir, del, copy), diskette care, and the PC keyboard. The DOS version used in class is 3.3, but the concepts are the same as in DOS version 4.0 or 5.0. This is NOT a typing class, so you MUST know where the alphabetic keys are located.

Day	Date	Time
Thursday	Jan. 20	12:55pm-3:25pm
Friday	Feb. 4	9:45am-12:15pm

Intermediate DOS 3.3: How to organize your hard disk You MUST take the Introduction to the PC and DOS class before taking this class. You will learn about making, changing, and removing directories from your hard disk. You will discover the function of an autoexec.bat file and how to modify that file.

Day	Date	Time
Monday	Mar. 28	12:55pm-3:25pm

Introduction to Windows 3.1 This is a new class designed to give you a basic understanding of Windows' features. This is NOT a typing class, so you MUST know where the alphabetic keys are located. Uses of the mouse and desktop orientation will be discussed. Moving, changing the size, and reducing/enlarging windows will be discussed. You will learn about File Manager for formatting diskettes, copying files, and creating directories.

Day	Date	Time
Wednesday	April 6	10:00am-11:30am

Intermediate WordPerfect 5.1: Creating Multiple Page Documents You must be very familiar with the PC and must have attended a recent Introduction to WordPerfect class to register for this class. You will learn to move or copy blocks of text, find and replace words or phrases, create a header and footer, add page numbers, and spell check your document. Lastly, you will create a title page.

Day	Date	Time
Wednesday	Mar. 23	12:55pm-3:25pm

Differences between WordPerfect 5.1 and WordPerfect Windows 6.0 You must be very familiar with the PC and WordPerfect 5.1 to register for this class. You will learn about the new WordPerfect screen, changes in Reveal Codes, navigating techniques and deleting methods. Commands have changed which effect fonts, undeleting, moving/copying text, saving and printing documents.

Day	Date	Time
Thursday	Mar. 31	2:00pm-3:30pm

Introduction to WordPerfect Windows 6.0: Creating Small Documents You must be very familiar with the PC to register for this class. This class is designed for people who are unfamiliar with WordPerfect. You will learn about the WordPerfect Windows screen. You will create, edit, save and open files. You will bold, underline, center, delete and move text. The differences between indent, double indent, and tab.

Day	Date	Time
Friday	April 29	9:45am-12:15pm

WordPerfect 5.1: Fonts & Tabs To register for this class, you must have attended an Introduction to WordPerfect class or have experience using WordPerfect regularly for several months. You will use fonts to change the style and size of letters for your entire document or for a section of text. You will also learn how to determine whether a font is proportional or not. Setting tabs is useful when you are using a proportional font.

Day	Date	Time
Thursday	Jan. 27	10:00am-11:15am

WordPerfect 5.1: Creating a Bibliography To register for this class, you must have attended an Introduction to WordPerfect class or have experience using WordPerfect regularly for several months. You will learn the slow and the fast way to create a bibliography with hanging indents. You will also learn how to sort your bibliography.

Day	Date	Time
Tuesday	Feb. 15	1:00pm-2:15pm

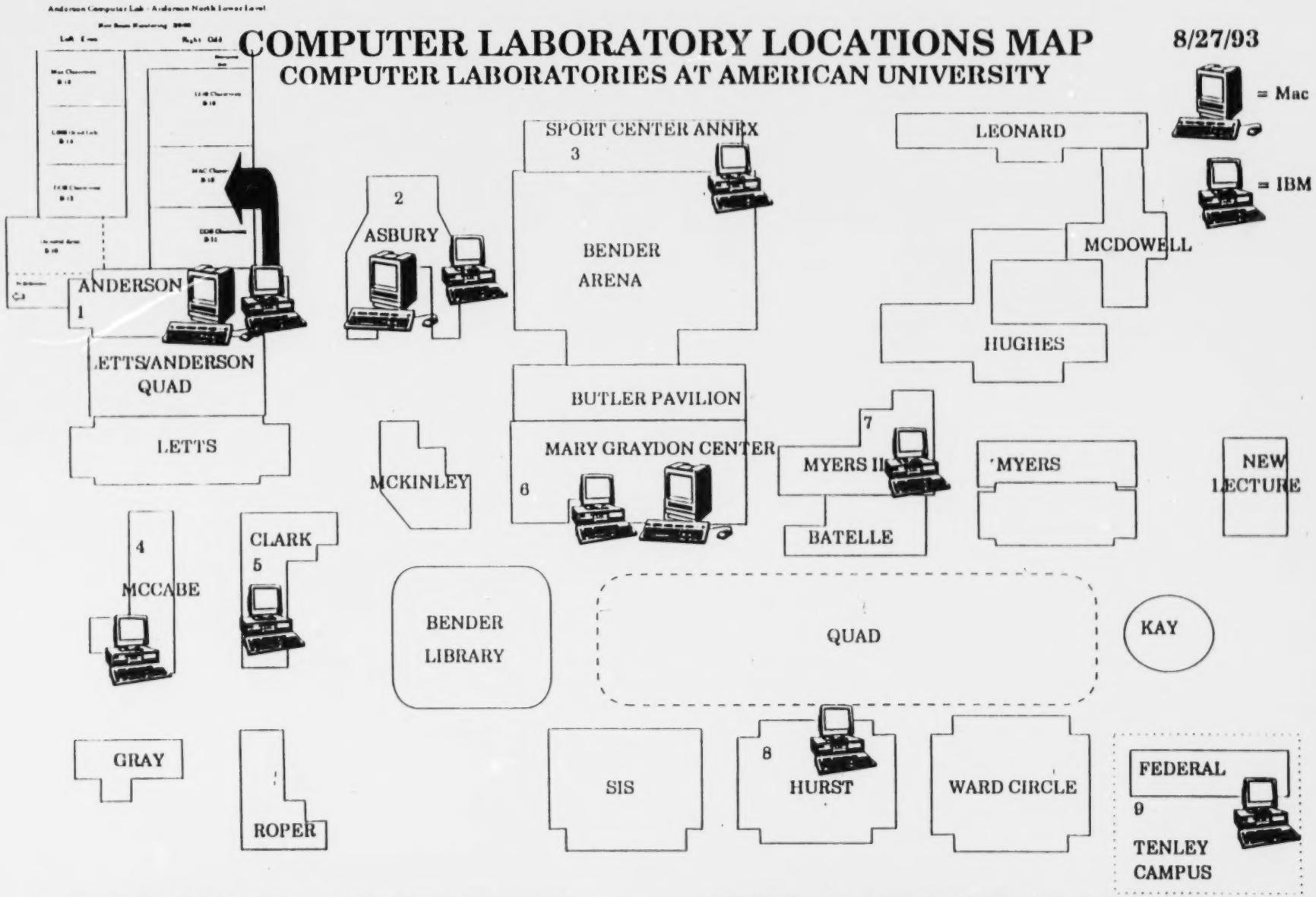
WordPerfect 5.1: Using Equations To register for this class, you must have attended an Introduction to WordPerfect class or have experience using WordPerfect regularly for several months. You will learn how to create and edit an equation in your document. You can create different math or scientific equals to appear differently in your document. For example, $\sum_{N-1}$.

Day	Date	Time
Monday	April 4	2:00pm-3:15pm

COMPUTER LABORATORY LOCATIONS MAP

8/27/93

COMPUTER LABORATORIES AT AMERICAN UNIVERSITY



1 Anderson - Public Labs, Computer Classrooms, CSIS Teaching & Grad. Research Labs
2 Asbury - Language Resource Center
3 Sports Center Annex - Business/Economics Lab (Restricted)
4 McCabe - Computer-Assisted Writing Center
5 Clark - MATH/STAT/CSIS Grad. Research Lab, Hardware/Intelligent Systems Lab (Restricted)
6 MGC - Mainframe Lab, Advanced Tech. Lab (Restricted), Freidheim Journalism Ctr (Restricted)
7 Myers II - Washington College of Law Library Lab (Restricted)
8 Hurst - Social Science Research Lab
9 Federal - Washington Semester Lab (Restricted)

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APPENDIX C

Sample Lesson

Quattro Pro Exercise
1

Introduction

This exercise demonstrates the value of the modern spreadsheet program for the classroom teacher. It demonstrates a few simple capabilities of Quattro Pro. More difficult tasks are described in manuals, books, and lessons sponsored by the University Computer Center. You are encouraged to make use of all of these resources.

In this exercise, you will consider several tasks related to the recording and analysis of grades. By the end, you will have:

1. averaged the grades of three tests given to a class of students;
2. determined the class average for each test;
3. calculated the class standing of each student;
4. and produced graphical representations of the grade distribution.

Loading Quattro Pro

1. From Anderson Resources Menu.
   A. Click on "Spreadsheets" icon twice.
   B. Click on "Quattro Pro for Windows 5.0".
   C. A blank spreadsheet will appear on the screen.

2. From AU Menu Screen.
   A. Press **[alt] [Q]**.
   B. The Basic Menu will appear. Continue as in #1.

Retrieving a File

After the program loads, a blank spreadsheet will appear on the screen. At this point, you could begin to enter data. For this lesson, however, please retrieve a partially completed spreadsheet called "newclass.wq1".

1. Click on "File" menu.
2. Go down to "Open". "Open File" box will appear on screen.
3. Move mouse to "Drives" box. Click on "Q:Anderson" to view all drives available.
4. Using the up and down arrows, click on "H:Anderson".
5. Go to "Files" and click on "newclass.wq1".
6. Click on "OK".
7. Click "yes", in response to "Open for read only?"

Quattro Pro Exercise 2

Entering Data

If all goes well, a small spreadsheet will appear on the screen. The spreadsheet contains 4 columns headed by; Name, Test 1, Test 2, and Test 3. To the right, there is a list of data that is missing from the main list of scores.

1. Use the arrow keys to move the cursor. Notice how each rectangle, or cell, corresponds to a letter (top of page) and a number (left column). Cells are identified by a letter followed by a number; A1, A2, C4, etc.
2. The first two lines have blanks (A3, B3, C3, A4, B4, D4). Move the cursor to one of the blanks.
3. Type the appropriate information from the Data listed to the right. The typed information will be displayed in the upper-left corner.
4. Press **[enter]**. The data will be entered on the spreadsheet.
5. Move the cursor to the next blank, type the appropriate data, and press the down arrow. Once again, the data is entered on the spreadsheet. Use of the arrow keys can save time when entering large amounts of data.
6. Fill in the rest of the blanks.

Editing Data

1. Correcting Mistakes
   - A. If the data has been entered on the spreadsheet.
     - i. Move the cursor to the correct cell.
     - ii. Type the correct data and press **[enter]**. The new data will replace the incorrect data.
   - B. If the data has been typed, but not entered (It will appear in the upper-left corner).
     - i. Use the backspace and delete keys to erase the mistake.
     - ii. Type the correct information and press **[enter]**.

2. Erasing Blocks of Material: erase the data table.
   - A. Highlight a block (F3 to H4) by clicking on F3. While holding down mouse, pull down and to the right to mark the appropriate block. When you let go, the block should be marked.
   - B. Click on Block menu.
   - C. Highlight "Delete" and click on "Rows"; "Delete Rows" box will appear.
   - D. Click "OK".

3. Calculations: Calculate a student's average grade.
   - A. Move the cursor to cell E3.
   - B. Type the formula for averaging three numbers "(B3 +

C3 + D3) / 3"

C. Press **[enter]**. The average of the three tests will appear at E3.

4. Copying Formulas: Copy the formula used in E3 to the rest of the test results.
   A. Move the cursor to E3.
   B. Pull down Block menu.
   C. Click on "Copy". Block Copy box will appear.
   D. In the "To" box, type "E4..E19". Click "OK".

5. More Calculations: Finding the class average for each test.
   A. Move the cursor to A20. Type "Average" and press **[enter]**.
   B. Move to B20. Use the following short-cut to calculate the average score for test 1: Type " @avg(B3..B19)" and press **[enter]**.
   C. The average will appear in cell B20.
   D. Now copy the function to blocks C20 and D20 using the method from #4 above.

Options

The average test values are displayed with all non-zero decimal places. Values possessing many figures will appear as "*****", if they do not fit into the column. To improve the display, we can specify the number of decimal places used throughout the spreadsheet.

1. Click on "Edit" to pull down Edit menu.
2. Highlight "Define style..."
3. Highlight "Format".
4. Use up arrow to change number of places to 1.
5. Click "OK".

Sorting Data

To determine class ranks, use the database tool called "sort." This function can rearrange the data to place the students in their grade order. Before doing this, however, copy the data. This needs to be done to avoid messing up previous work. The sort function occasionally scrambles the data, so it is wise to maintain an unspoiled copy.

1. Follow the steps given previously to copy the block "A1..E20" to block "G1..K20"
2. Click on Data menu. Highight "Sort".
3. Select "G3..K19" as the block to sort.
4. Sort on the basis of average grade by typing "K3..K19" as

the first sort key.
5. Click in the box next to "ascending" to remove this function and sort in descending order.
6. Click "OK" to start the sorting process.
7. The block should rearrange itself in the order of the average student grades.

Fill

The fill function can be used to quickly number the students' class positions.

1. Go to "Block" menu.
2. Highlight "Fill". Block Fill box will appear.
3. Type "M3..M19" in the blocks space.
4. Type "1" in "start", "1" in Step" and "19" in stop.
4. Click "OK".
5. Column M now shows each student's class rank.

Graphing

Spreadsheets can be used to make a number of types of graphs. In this exercise, you will make a grade frequency distribution plot, called a "histogram," and a plot of average grade vs. class standing.

1. Histogram
   A. Move the cursor to cell N1. Type the label "Interval" and press **[enter]**
   B. Type the label "Frequency" in cell O1.
   C. Enter **">95** in cell N3. Enter **">90** , **">85** , **">80**, **">75**, **">70**, **">65**, and **"<65** in the block from N4 to N10.
   D. Look at column K. How many students had average grades higher than 95? The answer is zero, so enter "0" in cell O3.
   E. Fill in the rest of column O using the number of students with average grades between 90 and 95, 85 and 90,
   F. Block the frequency column, (O3..O10).
   G. Look to the toolbar. Click on the icon 5 from the left, (icon of histogram).
   H. Move cursor onto the main screen and click mouse to place the newly-created graph within the window.

2. Plot one student's profile.

   A. Go to Graph menu, and highlight "New".
   B. Type "Noel" to name the graph.

C. In order to label the x-axis, highlight box and type "B1..D1".
D. In the "Y-axis" box, type "Grade".
E. For "1st", type "B10.D10".
F. Click "OK".
G. A pie graph now appears.
H. It would be more helpful given the type of information at hand to use a different type of graph. Go to Graph menu and highlight "type".
H. Click on line graph.
I. Click "OK".

Congratulations! You have now mastered a wide range of spreadsheet functions. Keep this worksheet as a reference and do not hesitate to take the computer center's class if you would like to learn more.

APPENDIX D

Computer Analysis Checklist

Analyzing Educational Software: Reading/Language Arts

Use the following checklist to analyze a piece of educational software in the area of reading/language arts.

A. Educational Value

1. Is the content important to learning reading/language arts? Why or why not? Give a brief explanation of an activity that supports why you answered as you did.

2. Can the same activity be done just as well with nonelectronic media? Explain your answer.

3. Does the program involve actual experiences in reading/language arts, or is it all isolated drill instruction?

4. Is the program of use to students with special educational needs? Explain briefly.

5. Are instructional objectives stated, and does the program fulfill those objectives? Please explain.

6. Is the program sensitive to diversity issues? In other words, is it gender neutral? Is it culturally fair? Is there an absence of gender, racial or ethnic stereotypes?

B. User Friendliness (Most of these questions can be answered either yes or no.)

7. Are screen pages easy to read, with appropriate spacing between lines?

8. Is the print size appropriate? Can the font type interfere with emergent readers?

9. Is the student able to leave the program at any point?

10. Does the student control the rate of presentation?

11. Can the student return to previous screen pages?

12. Does the program accept abbreviations for frequent responses? Give an example.

13. Can the menu/instructions be accessed easily from any screen?

14. Does the program allow input mistakes to be corrected?

15. Does the student need a mouse for the program? Function keys? Both?

C. Capabilities

16. Are graphics of high quality?

17. Is audio included? Can the audio be turned down or off?

18. Does the program time the student's work?

19. Is a score kept of student achievement?

20. Does the student control the forward and backward movement through the program?

21. Is immediate feedback given?

22. Are explanations of incorrect answers provided?

D. Safe Guards

23. Does the system crash if an inappropriate key is pushed?

24. Does the program inform the user if an inappropriate key is pushed?

25. If the RETURN (ENTER) key is accidentally pushed before any input has been typed, will the program give the user a second chance?

26. If the reader cannot figure out the answer, will the program give the user a second chance?

27. Will the program refuse to accept input of inappropriate length and tell the user why it refuses?

28. Is the program reasonably protected against sabotage?

29. List four strengths (or weaknesses) of this software package. List at least one weakness (or strength) of the program. Explain your lists in a half page summary encompassing both the strengths and weaknesses of the program.

30. Write a letter to the school principal, highlighting the reasons to buy or not to buy the program.

APPENDIX E

Course Syllabi

Mathematics for Elementary School Teachers 21.250

SPRING 1994 Tuesday, 8:30 am

Instructor: Lynn H. Fox, PhD.
Office Location: McKinley Phone: (202) 885-3730
Office Hours: Tuesday, noon til 2pm Thursday, 1pm -5pm.
and by appointment

This course surveys the standard mathematics curricular content for grades K through 6 with some additional material related to enrichment for advanced students. The main objective of the course is to help you become a superb teacher of mathematics at the elementary school level. To accomplish this you will need to:

a. Obtain a level of complete mastery of the mathematical concepts and operations.
b. Obtain a high level of confidence in your ability to teach this mathematical content.
c. Learn a variety of approaches for presenting material.
d. Learn to use manipulatives, visuals, games, and other materials.
e. Learn to create your own teaching aides and visuals.
f. Learn about ways to use technology in teaching the material.
g. Develop a positive image of yourself in relationship to learning and teaching mathematics.
h. Develop an appreciation for the structure of basic mathematical systems and operations.
I. Learn to assess student progress through formal and informal assessment.
J. Become knowledgeable about resources for instructional ideas.

At the beginning of each unit in the text several specific objectives are stated for the unit that relate to these broad goals and combine your mastery of content with insights into how to help children master this material. You are expected to read all assigned material on your own even though there will not be time to discuss everything in class. You are advised to work through all the practice tests in each unit and check your answers and come to class ready to ask for help with those questions you did not fully understand or were confused by. During the class you will play the role of learner and teacher. You will make one major presentation on mathematical content and how to present it by yourself and one as part of a group using ideas suggested in our text and some from other sources. In addition you will alone or in a group make shorter presentations or demonstrations relative to computer software, use of manipulatives, and the creation of your own teaching materials (such as make up a game for a small group to play or a learning station or for whole group instruction).
More details on each assignment will be provided separately and the division of grading and the course schedule should help clarify the process.

Your grade will be based on the following components:

Test I Units 1-10	10%
Test II Units 11-15	10%
Final Exam Units 1-15	20%
Group Presentation-Unit	10%
Individual Presentation-Unit	10%
* Demo and Analysis of Use of Technology (Microcomputers,etc.)	10%
* Demo of use of Manipulatives	10%
* Creation and demonstration of games/puzzles visual aids/etc.	10%
Class participation (includes group work on test construction and individual work on worksheet and other activities in class)	10%

* At least one of these should be done as an individual project and at least one as a group effort. There will be sign up sheets and people can choose among the options and dates.

Regular attendance is required. Two unexcused absences will be grounds for being dropped. Make-up or early tests will be given in extreme circumstances only such as documented hospitalization.

To pass the course both tests must be passed with an 85 or better. Don't panic. The majority of these tests will be directed at assessing your basic grasp of elementary level mathematical concepts and operations. To be ready to teach mathematics at the elementary level one must have mastery of the fundamentals. Those failing to achieve the criteria of 85% the test on the first attempt will be offered an alternative test for retake and can seek extra tutoring if necessary. The final examination will be focused on the ways to present mathematical material to children at the appropriate levels and will draw from the activities we will do in class, the text, and your presentations and demonstrations and those of your classmates.

Mathematics for Elementary School Teachers #21-250
Spring 1994, Tuesday 8:30 am
Tentative Schedule

Week	Topic	Basic Reading
Jan. 11	Goals and Objectives	
Jan. 18	Learning and Teaching Mathematics Problem Solving in Mathematics	1,2,3
Jan. 25	Demonstration Lessons and Planning Units 4 and 5 Numeration and Place Value	4,5
Feb. 1	Group Presentation Unit 6: Add/ Subtraction Group Presentation Unit 7: Multi/Division Individual demo on manipulatives	6 7
Feb. 8	Group Presentation Unit 8:Number Systems Group Presentation Unit 9:Fractions Individual demo on games/puzzles/visuals	8 9
Feb. 15	Group Presentation Unit 10: Fractions Intro to test construction/worksheets	10
Feb. 22	Test 1: Units 1-10	
Mar. 1	Using Microcomputers and Calculators in Teaching Group Presentations in Anderson Computing Center	
Mar. 8	Spring Break	
Mar. 15	Individual Presentation Unit 11:Decimals Test construction and worksheets continued	11
Mar. 22	Individual Presentations on Microcomputers and Calculators in Anderson Computing Center	
Mar. 29	Individual Presentations Unit 12:Graphs, Statistics Group Demo Manipulatives	12
April 5	Individual Presentations Unit 13: Measurement Group Demo Games/Puzzles/Visuals	13
April 12	Individual Presentations Unit 14: Geometry Test II	14
April 19	Individual Presentations Unit 15: Geometry Review and Conclusions	15

Final EXAM Tuesday May 3

BASIC TEXTBOOK
Today's Mathematics 7th edition (1992) by James W. Heddens and William R. Speer published by Macmillan.

Theories of Educational Psychology 21.620
SPRING 1994 Thursday, 5:30pm

Instructor: Lynn H. Fox, PhD.
Office Location: McKinley Phone: (202) 885-3730
Office Hours: Tuesday, 1-3pm;Thursday, 1pm -5pm. or by appointment

Educational Psychology is the study of behavior related to learning. As a discipline it seeks to translate the theory and research of psychology into practical applications in educational settings, and to study the problems and issues of education from a psycho-social perspective. Thus, the major goal of this course is to provide an overview of the characteristics of the learner, the process of learning, and the situation or environment in which learning occurs and the interactions of these three.

We will cover the topics of individual differences and their assessment, human growth and development with an emphasis on the psychology of the child, theories and research about cognition and learning including memory and problem solving, and the social and organizational psychology of classroom management. The course will provide a survey of the tools and methods of research as well as the results of numerous classical and recent studies. Specific goals and objectives will be outlined for each topic area and students will be encouraged to expand upon these in terms of their own learning lives.

Class time will involve lectures, demonstrations, simulations, group and individual presentations and discussions in small or large groups. Each student will participate in either a "field" experience observing and teaching a child or children in either an informal or formal educational setting, or a self-learning project in which the student will undertake to learn something new (other than something being taken for credit) and analyze the experience in terms of behavioral and cognitive learning theories. Tutoring assignments under the supervision of a teacher are available at Murch Elementary school (located a few blocks from the Tenley-AU metro stop) and Martin Luther King, Jr elem school in Anacostia. A limited number of pre-school or special education placements may be available at the World Bank or the Child Development Center. Secondary placements will need to be arranged on your own and often private schools are more open to this. Self-learning projects can involve taking informal classes such as "The Art of Mime" or "Self-Defense", "Desktop Publishing" offered in the larger community or on campus. Many area libraries offer courses, and TAU computer center as classes.

Students participate in one group project resulting in a presentation to the entire class. There will also be one brief individual oral report to the class summarizing a longer written report on a topic of interest to the student and class such as violence in the schools, the experiments in "inclusion" and mainstreaming for special populations students, learning-styles, multi-cultural education, trends in the school-to-work transition, research on cooperative learning.

The grading is as follows:

Group Report	10%
Written special topic report	20%
Study Guide/or Review	10%
Tutoring /Self-learning report	20%
Midterm	20%
Final	20%

Theories of Educational Psychology #21-620
FALL 1994, Thursdays 5:30pm
Tentative Schedule

Week	Topic	Basic Reading**
Sept 1	Goals and Objectives	1
Sept 8	Language and Cognitive Development	2
Sept 15	Personality, Social and Moral Dev.	3
	Ability and Exceptionality	4
Sept 22	Ability and Exceptionality	4
	Assessing aptitude and achievement	14
Sept 30	Oral Group Reports on Age/Gr Profile	
Oct 6	Culture and community	5
Oct 13	Evaluation and grading*	15
	Anderson Computer Lab	
Oct 20	Behavioral Learning Theory*	6
	Take-home midterm due	
Oct 27	Cognitive Learning Theory*	7
	Applied Theory	8
	(Written Topic REPORTS DUE)	
Nov 3	Motivation	9 & 10
Nov 10	Classroom Management*	11
	Computers in the Classroom	
Nov 17	Planning to Teach*	12
	(Tutoring/Self-learning Reports due)	
Nov 31	Effective Teaching	13
Dec 8	Review and Synthesis	

Final EXAM DEC 15

* Note place or assignments due
** Chapters in basic text, and related articles in Readings and Cases, some other articles to be assigned later

BASIC TEXTBOOK
Educational Psychology 5th edition (1993) by Anita E. Woolfolk
Boston:Allyn and Bacon.
Readings and Cases in Educational Psychology by Woolfolk

Psychology of Education **21.320**
Fall 1994 **Tuesday and Friday, 11:20am**
Lynn H. Fox, PhD.
Office Location: McKinley 109 **Phone: (202) 885-3730**
Office Hours: Tuesdays, 1-3 Thursdays, 1-5 and by appointment

Educational Psychology is the study of behavior related to learning. As a discipline it seeks to translate the theory and research of psychology into practical applications in educational settings, and to study the problems and issues of education from a psycho-social perspective. Thus, the major goal of this course is to provide an overview of the characteristics of the learner, the process of learning, and the situation or environment in which learning occurs and the interactions of these three.

We will cover the topics of individual differences and their assessment, human growth and development with an emphasis on the psychology of the child, theories and research about cognition and learning including memory and problem solving, and the social and organizational psychology of classroom management. The course will provide a survey of the tools and methods of research as well as the results of numerous classical and recent studies. Specific goals and objectives will be outlined for each topic area and students will be encouraged to expand upon these in terms of their own learning objectives.

Class time will involve lectures, demonstrations, simulations, group and individual presentations and discussions in small or large groups. Each student will participate in either a "field" experience observing and teaching a child or children in either an informal or formal educational setting, or a self-learning project in which the student will undertake to learn something new (other than something being taken for credit) and analyze the experience in terms of behavioral and cognitive learning theories. Tutoring assignments under the supervision of a teacher are available at Murch Elementary school (located a few blocks from the Tenley-AU metro stop). A limited number of pre-school or special education placements may be available. Self-learning projects involve taking informal classes such as "The Art of Mime" or "Self-Defense", "Desktop Publishing." Many area libraries and TAU computer center offer free or inexpensive classes.

Students participate in one group project resulting in a presentation to the entire class. There will also be one written report on a topic of interest to the student related to the class such as violence in the schools, the experiments in "inclusion" and mainstreaming for special populations students, learning-styles, multi-cultural education, trends in the school-to-work transition, research on cooperative learning.

There will be four tests, one of which will be during the final exam period. This fourth test will be comprehensive, especially over chapters 6-13. The three best grades will be used unless you have missed one of the tests. There are no makeup tests except in the rare instance of a documented medical emergency. Regular attendance is important for group participation,

The grading is as follows:

Group Report	10%
Written special topic report	20%
Tutoring /Self-learning report	20%
Best 3 of 4 test grades (15%each)	45%
Organization and participation	5%

** Final exam is weighted as one of the four tests although it is comprehensive.

BASIC TEXTBOOK

Educational Psychology 5th edition (1993) by Anita E. Woolfolk
Boston: Allyn and Bacon.

Psychology of Education #21-320 Fall 1994, Tuesdays and Fridays 11:20am

Tentative Schedule of Assignments

Week		Topic	Basic Reading**
Aug 30	T	Introduction	
	F	Goals and Objectives	1
Sept 6	T	Language and Cognitive Development	2
	F	Personality, Social and Moral Dev.	3
Sept 13	T	The Developmental Theories and Research	TO BE ASSIGNED
	F	The Assessment of Aptitude and Achievment	14
Sept 20	T	Oral Group Reports on Age/Grade Profile	
	F	Oral Group Reports on Age/Grade Profile	
Sept 27	T	Review	
	F	Test I	
Oct 4	T	Special Needs Populations	4
	F	Culture and community	5
Oct 11	T	Behavioral Learning Theory	6
	F	Applied Learning Theory	
Oct 18	T	Cognitive Learning Theory	7
	F	Applied Theory	8
Oct 25	T	Review	
	F	Test II	
Nov 1	T	Motivation	9
	F	Motivation	10
Nov 8	T	Testing and Evaluation	15
	F	Anderson Computer Lab	
Nov 15	T	Classroom Management (Written report due)	11
	F	Planning to Teach	12
Nov 23	**W**	**Computers in the Classroom (Anderson Lab)**	
	F	Holiday	
Nov 29	T	Effective Teaching	13
	F	Effective Teaching (Tutoring/Self-learning Reports due)	
Dec 6	T	Test III	
Dec 13	T	Final exam 11:20 til 1:50	

Final Exam will be weighted as one of the four tests, but it will be comprehensive

** Chapters in basic text, other reading to be assigned later

THEORIES OF READING--21.371.01
Wednesday, 12:45P-3:25P
Ward 5

Instructor:
Deborah L. Thompson, Ph.D.
109 McKinley Bldg.
Phone: 885-3719

Office Hours:
Tuesdays:12:00P-4:00P
Thursdays--1:00P-3:00P
Others by appointment

Required Texts:

Au, K.H. (1993). ***Literacy instruction in multicultural settings***. Ft. Worth: Harcourt, Brace.

Center for the Study of Reading. (1985). ***Becoming a nation of readers***. Washington, DC: NIE.

Davidson, J. L. (1988). ***Counterpoint and beyond: A response to Becoming a nation of readers***. Urbana, IL: NCTE.

Readings on Reserve:

Au, K.H. (1993). ***Literacy instruction in multicultural settings***. Fort Worth,TX: Harcourt.

Bloome, D. (1985). Reading as a social process. ***Language Arts***. ***62*** (2), 134-142.

Gee, J.P. (1989). Literacy, discourse, and linguistics: Essays by James Paul Gee. ***Journal of Education. 171*** (1), complete issue.

Graubard, S. (Ed.). (1990). Literacy in America. ***Daedalus. 119*** (2), complete issue.

Heath, S.B. (1982). What no bedtime story means. ***Language in Society. 11***, 49-76.

Solsken, J. (1993). ***Literacy, gender and work: in families and school***. Norwood, NJ: Ablex Publishing.

Purpose:

The major purpose of this course is to explore the fundamentals of literacy. Attention will be given to theories, concepts, principles, and research in education which inform literacy instruction. Special attention will be given to teaching the emergent reader and the ESL student and to the technological and cultural influences on literacy instruction.

Objectives:

Upon completion of this course, students will have learned about:

1. Major theoretical views on the nature of the reading process.

2. Current thinking and research concerning reading comprehension.

3. The approaches to the teaching of reading and the philosophical conflict amongst experts as to which approach produces the "best readers."

4. Cultural, linguistic and social factors which affect literacy acquisition.

5. The relationship between technology and literacy instruction.

6. Theoretical views on the nature of the writing process.

Requirements:

Regular class attendance and participation are required. Assignments are due on the date listed on the calendar. **I know that unforseen things can happen to prevent you from turning an assignment in on time: inclement weather, you contract beriberi, dog eats assignment, cat barfs on assignment, car is towed with assignment locked inside, printer ribbon breaks or is missing, computer does unspeakable things to your disk or file, pet rock dies, etc. Life is just that way. Therefore, each student will be allowed to have ONE of these mishaps occur during the semester. The victimized student will have until the following Monday to complete the assignment. After the deadline has passed, I will record a zero for that assignment.** Other (graded) assignments turned in late will lose a letter grade per day late. All assignments are to be word processed, WordPerfect 5.1, MicroSoft Word, etc. Please note that spell check catches spelling errors and not usage errors. Essays should follow APA format (3rd ed.) or MLA format (3rd. ed.). **There will be no make-up exams nor extra credit work.** Students who miss exams legitimately may choose to write an extended essay (on a topic mutually agreed on by student and instructor) or have the percentage of the grade for the missed exam roll over to the next exam. Grading for all assignments will focus on content and how well the content is communicated to the instructor. Also, attention will be paid to mechanics such as punctuation, neatness, spelling and grammar. As you are professionals in training, your assignments and class participation are expected to reflect this growing professionalism. Please note the University's Academic Integrity Code is honored in this class. **STUDENTS WITH SPECIAL NEEDS PLEASE SEE ME BEFORE THE START OF CLASS.**

Grade Scale:

A	**100-95**
A-	**94-92**
B+	**91-89**
B	**88-85**
B-	**84-82**
C+	**81-79**
C	**78-75**
C-	**74-72**
D	**71-65**
F	**Below 65**

Assignments:

1.) Abstracts of articles on literacy. Upon completion of the library workshop, you will have a working knowledge of Aladin and the Lexis/Nexis network. This assignment is an Aladin-based assignment. Read and abstract two journal or microfiche literacy articles selected from ERIC. Read and abstract two journal or microfiche literacy articles from GENL. Turn in one printout of a book (on literacy) selected from CATS. Include with the printout a copy of the book's table of contents and/or index. Format will be given out in class next week (January 19, 1994). **DUE DATE: FEBRUARY 2, 1994.**

2.) Using the Modified Burke Interview Form, interview three adults and three children of varying ages. Compile the results in chart format. Compare the differences among the subjects. Note any differences you may find between child readers and adult readers. Write a brief essay (2-3 pages word processed) on what you discovered about people's beliefs about reading. **DUE DATE: FEBRUARY 23, 1994.**

3.) Creating a lesson using computer software for literacy instruction. There are several software packages in Anderson Lab that focus on literacy instruction. A software list will be handed out in class. Create a lesson using on of the software packages. Include an adaptation of the lesson for students with learning disabilities. I will assign the disability through random selection. Lesson plan and adaptation will be shared in class. **DUE DATE: MARCH 23, 1994.**

4.) Group Assignment: Using the LEXIS/NEXIS Network. In self-selected groups, you will track a piece of education legislation through Congress or track a literacy issue in a foreign country. Class presentations and a written explanation are required. Guidelines will be given out after the LEXIS/NEXIS workshop on January 19. DUE **DATE: APRIL 20, 1994.**

5.) Essay on literacy instruction for ESL students. Analyze the literacy research on ESL students. Library research will not suffice. Include at least one interview from a classroom teacher. The teacher can be regular classroom or a specially trained ESL teacher. References for your essay (3-5 pages word processed) should have a minimum of three outside articles in addition to chapter 9 in the Au text. In the essay, you will focus on the strengths and weaknesses of ESL literacy instruction. Be prepared to discuss your research in class. **DUE DATE: APRIL 6, 1994.**

6.) **E-mail:** Two assignments are to be completed using e-mail. Guidelines TBA.

7.) **MIDTERM EXAM: MARCH 2, 1994.**

8.) **FINAL EXAM, APRIL 28, 1994.**

Course Calendar

Date	Topic	Readings	Assignment Due
1/11	Course overview		
1/19	**MEET IN LIBRARY CLASSROOM IN BENDER LIBRARY.**		
1/26	Seeking a common definition of reading The reading process	Au 1, BNR pp. 1-18 Davidson, pp. 43-49	
2/2	Theoretical models of reading Literacy v reading: What's the difference?	Au 2, 3 Gee, What is literacy? Graubard, Historical roots of literacy	Abstracts
2/9	Emergent literacy	Davidson, pp. 17-62, 51-62 BNR pp. 21-58	
2/16	Cultivating nurturing literate environments Technology and reading	Au 4,5	
2/23	Extending literacy	BNR pp. 61-82 Davidson pp. 69-77	Interviews
3/2	Midterm Exam		
3/9	**SPRING BREAK**		
3/16	Socio-cultural influences on learning to read	Davidson pp. 27-32 Au 6 Heath article Solsken text Bloome article	
3/23	Linguistic influences on learning to read	Au 7, 8	Computer software
3/30	The writing process	Au 10	
3/29	Types of reading instruction The teacher's role	BNR pp. 85-92, 103-114	e-mail practice

4/6	Evaluating reading/writing	BNR pp. 95-101	
4/13	What is whole language?		e-mail practice
4/20	Literature for a diverse society	Au 11 Davidson pp. 63-67	Lexis/Nexis project

4/28 FINAL EXAM

Grade Allotment

Literacy Abstracts	10%
Interviews	15%
Software Lesson	10%
ESL Paper	15%
LEXIS/NEXIS project	15%
Midterm	10%
Final	15%
Class Participation	10%

Class participation will include activities completed in class. With the exception of the e-mail activity, you have to be in class to get credit for the activity.

Please note: I will deduct up to five points from an assignment turned in handwritten, if the syllabus calls for it to be word processed.

APPENDIX F

User's Guide to Educational Software

User's Guide
to
Educational Software

The American University
School of Education
109 McKinley Building--8030

INTRODUCTION

Welcome to the wonderful world of educational computer games! With the arrival of computers in the classroom, educational games are quickly becoming an integral part of classroom learning. As a prospective teacher, the responsibility of using such games falls onto your shoulders. Lucky you, huh? Relax, computer games can be a lot of fun for both student and teachers. With a few basic skills, anyone can learn how to use such educational tools in a short period. The purpose of this guide is to help you learn the necessary skills to help accelerate the learning process and quickly guide you through the seemingly complex maze of computer technology.

Whether you have computer skills or not is unimportant. Remember, these games are designed to be used in a limited classroom period. Teachers cannot spend an inordinate amount of time explaining to their students complex instructions on how to use these games. Computer time is a valuable commodity in a school. Every precious moment should be dedicated toward the learning experience, not wasted on boring "how-to's." Therefore, each game is simply laid out with clear and precise instructions. Of course, some are more involved then others, but even those games can be mastered in a short period.

This guide is provided to help make your initial interaction with educational games an easier, more pleasant experience. The following pages contain brief overviews of each educational game currently available on the system. Each overview contains brief instructions for accessing the various games, along with brief summaries on how each game works, what age level they are intended for, helpful hints for quitting the game, and troubleshooting suggestions that should solve most of your problems.

Of course, computers sometimes have a mind of their own and do wacky things when they are tired or cranky. A manual of much larger proportions would be needed to answer all such troublesome questions, so remember, if you run into problems, the folks at Anderson Labs are quite happy to help you if you should need it. The important thing to keep in mind is not to be intimated by computers. They are not monsters lurking in the dark and you should not be hesitant to explore them. The days of having to write your own programs are long past (remember those horrible Commodore 64's!). User-friendly is the keyword, and you should constantly remind yourself of that when you hit the Enter button. Have fun! Enjoy! Play with them as long as you like. I guarantee that eventually you will be caught up with them, and before you know it, two hours have passed and you are left wondering where the time has gone.

So, enough talk! Turn to the first page of this manual, turn on your computer, and let's begin.

STOP!
READ THIS BEFORE CONTINUING

As mentioned in the Introduction, this manual cannot possibly answer every question that you have or solve every problem that may occur while playing anyone of these games. Also, the people who work at Anderson Computer Labs are constantly improving, revamping or simply changing the computer network. The descriptions provided in this manual may be out-dated by the time you actually sit down at the computer. I apologize for that, but alas, the waves of change run swiftly in the computer lab. So, with that said, below are a few liner notes explaining the state or condition of the computer lab at the time of this printing.

1. Though **SimEarth** is listed in the Table of Contents, it does not have a game summary written for it. The reason for this is that SimEarth is password protected, which means you need the manual in order to enter the password. Since I cannot possibly predict which password the game will require, if you wish to play SimEarth, you must obtain the manual from the front desk.

2. Though **Time Riders in American History** and **Probability Lab** are listed in the Table of Contents, they do not have game summaries written for them. The reason being is that when it came time to print this manual, Time Riders and Probability Lab were not working properly. Therefore, I could not write summaries for them. Since they may be working by the time you play with them, you're on your own. I do remember that if you want to exit Time Riders, you must open the locker in one of the rooms and select Exit. The Escape key does nothing in that game. Good luck!

3. Sometimes, when you go to exit any of the games, you exit to a DOS prompt instead of the Anderson Lab Menu. If at any time you find yourself at a C:\ or H:\ or K:\ prompt you must do the following: Type H: and hit Enter. At that prompt, type **"menuhelp"** and hit Enter. This should bring up the Anderson Main Menu. If this still doesn't work, follow the instructions below.

4. If at any time the screen or keyboard should freeze up on you, or you end up in some place where you simply can't get out of it, hit the **Control-Alt-Delete** keys simultaneously. This will reboot the computer and either return you to either Windows or the Anderson Lab Main Menu. Follow the startup instructions to return to the games.

5. Besides the three main menu options of Math/Science, Language, and Social Science/History, there is a new category called **38.554** that includes the following games: **Phrasal Verbs, Vocabulary Builder, Vocab Improver, Sequitur, Text Tanglers, Fortune Teller**. Only some of these games were operating at the time of this printing. They may all be working when you sit down to use them. Just follow the on screen instructions to play them.

GETTING STARTED

NOTE: For those of you familiar with Anderson Labs and with IBM computers, you can skip this detailed description and go to the end of the section where you will find a quick summary on how to access the games.

The first thing you need to do is to find yourself a computer. All of the games can be found on the computers in Anderson Computer Lab. The computer lab is located in the basement of Anderson Hall. To enter, you will need to have an American University identification. Once inside, you can either use the computers in Room B12 or B14. I suggest using the ones in B14, because some games require additional memory and can only be accessed from B14. Before going into the labs, it's a good idea to check the times when the classrooms are available. The list of times is posted right outside the door and a quick glance will tell you how much time you have to use the computers. If a class is in progress, you cannot enter and must come back another time.

The computers are typically "on" when you enter the classroom. If your computer screen is blank, try turning it on from either the button located in the front of the computer beneath the screen, or by the button in the back. If neither button works, it's a good indication that particular computer is currently down, and you should start looking for another terminal.

At Anderson, students leave the computers in various states of disarray. Most of the computers in the Lab use Windows, but other programs such as QuattroPro, WordPerfect and various other databases can also be accessed through these terminals. Since I cannot control the way students exit their programs, I must assume an ideal world and hope that when you choose your computer it is still in Windows mode and currently not in another program. If you have a problem finding the Anderson Lab Main Window, ask for help. A quick fail-safe method is to hit **Control-Alt-Delete** simultaneously and the computer will re-boot itself and automatically come up to Windows. This method is not recommended as a standard

procedure, but only if necessary. Though it will not hurt the computer, it takes a long time (over a minute!) for the computer to reset itself.

O.K., assume we have an ideal world, and you are currently in Windows. Windows is basically a way to organize everything stored in your computer. It provides easy access to anything you currently want to use. Though it is a wonderful program, it is useless for our purposes. Therefore, you must exit it. Don't panic, it's very easy. You will need the mouse, (no, not Mickey) to help you do this. The mouse is the small white object located next to the key board. Place your hand on the mouse and move it in small circular motions. You will notice that as you move the mouse the small arrow on the screen follows your motions. That's because the mouse is sensitive to your movements and the arrow will follow in whatever direction you move the mouse. You will notice that the mouse has two buttons, sometime three, at the very top of it near your fingers. The only button you must concern yourself with is the one on the far left.

- To close Windows, move the arrow until it is pointing at the small square with a dash in its center. The square is located in the upper-most left-hand corner of the screen above the word **Options**. Make sure the tip of the arrow is touching the square!
- Using your finger, gently click on the left-hand button of the mouse.
- A "window" will appear on the screen. From the window, move the arrow point to the word **Close**. Click the mouse button.
- Another window will appear asking if you want to close Windows. Move the arrow to OK and click on it.

(NOTE: Anderson has been changing their Windows format. Closing Windows may bring you to a DOS prompt (C:\) instead of the Anderson Main Menu. If this happens you need to do the following: Type **H: ("H" and a colon)** and hit Enter. Now type **menuhelp** and hit Enter.)

If your screen now says The Anderson Lab at the top, you have successfully closed Windows. Easy, huh? Now, you are presented with a list of alternatives. You no longer need your mouse, since the mouse is adapted for Windows and not for other functions. To access different menus, you can either use the Arrow keys located besides the Enter key, or you can simply type the number of your choice using the number keys. Let's use the Arrow keys. To access the games, you must:

- Highlight # 1 - **Anderson Labs** using either the Up or Down Arrow key. Press the Enter key.
- Another menu appears. Highlight # 8 - **Classroom Activities** by hitting the Down Arrow key. Press the Enter key.
- Another menu appears. Highlight # 2 - **Education Class Assignments** by hitting the Down Arrow key. Press the Enter key.
- Another menu appears. Highlight # 1 for **Math and Science** games, # 2 for **Reading and Language** games, or # 3 for **History/Social Science** games. After selecting your choice hit Enter.
- Depending on what category you chose from, a list of different games will appear. Select the game that sounds most interesting to you.
- Before the game starts, another menu appears with a lot of different department names. This is just a menu used for keeping track of which departments use which games. For our purposes, highlight **#21 - Education**. Again use the Arrow keys and press the Enter key.
- The game of choice should begin.

You are now ready to experience educational games for yourself. Turn to the page in the manual where that game you want to play is described in detail and press Enter. Your adventure begins... Good Luck!

QUICK START

For those familiar with Anderson Labs and IBM computers, here is a quick way to access the games.

- exit Windows
- (Note: You may be at a DOS prompt. If you are type **H:** and hit Enter. Then type **menuhelp** and hit Enter.)
- From Main Window, select **# 1 Anderson Labs**
- Next, select **# 8 Classroom Activities**
- Next , select **# 2 Education Class Assignments**
- Next, select **# 1 for Math & Science; # 2 for Reading & Language; or # 3 for History/Social Studies**
- From next menu, choose the game you want to play
- Finally, from the next screen choose the department most closely associated with your use of these games. Choose **#21 Education**
- The game of choice begins

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ALGEBRAX

Age: 13-15 Grade Level: 8th-10th Topic: Algebra

Goal: Students are guided through basic algebra skills. Their progress is monitored by the computer as they progress through the lessons and answer the necessary equations.

To Play: To begin, **Type** your first and last name and hit **Enter**, hit **Yes** when it asks you if this is correct. Use the **Arrow keys** to highlight selections and the **Enter key** to select.

Procedure:

The **Main Menu** consists of 11 Options briefly described below:

- **How to Use This Disk:** A brief tutorial on how to use the software. Allows the teacher to key the tutorial to the textbook that the school uses. Teaches you how to type exponents, fractions, and other algebraic formulas using the Arrow keys. To escape the tutorial, hit the End twice.

1. **Inequality Symbols:** Gives a brief lesson on positive and negative numbers. Use the Up and Down Arrow keys to type fractions, the ? to have the computer show the answer, the Del key to change the problem, and the End key to return to Main Menu.

2. **Combine Mult Signed Nos:** Same as above, tutorials are used to learn how to combine and multiple signs.

3. **Remove parenthesis:** Same as above.

4. **Division Signed Numbers:** Same as above.

5. **Order of Operations #1:** Same as above.

6. **Simplifying exponents:** Same as above.

7. **Distributing:** Same as above.

- **See your Records:** Allows you to see what scores you achieved on each level of the game. Keeps track of the number you got right and gives you a total percentage score.

- **Other Software Available:** Gives you a list of current math software available for schools

- End this session.

NOTE: Cannot hit Escape to return to Main Menu. Can only use the End key and the Arrow keys

ANCIENT EMPIRES

Age: 10-14 **Grade Level:** 5th-9th **Topic:** Basic Math Skills

Goal: Students develop math skills as they seek out treasure in various regions across the world.

To Play: First, turn off sound with **Control "S"**. Next, scroll through story by hitting the **Enter Key**. Next, comes player sign-in. Hit **Enter** to start new game. If sign-in list is full, hit **Enter** to continue. A menu will appear asking you if you want to remove a player's name. Select **Yes** using the **Arrow keys** and hit **Enter**. **DO NOT SAVE GAMES**. Now, hit **Enter** to start a new game.

Procedure:

- To play, first type in your name. Next, it will ask you which level of difficulty you prefer. The game recommends playing at the Explorer level, and so do I. This game is hard! Hit Enter. The first screen you come to is a map menu. You can choose to explore Greece & Rome, Egypt, Near East, or India & China. Use the Arrow keys to select the region and hit Enter. Once in the game, use the Arrow keys to move, use the Enter key to change the tool shown in the box, and press the Spacebar to use that tool. You have a choice of three tools: A light beam from a miner's hat, tennis shoes to jump high, or a force field to protect you from cave creatures.

- New user messages will appear explaining the game, just keep hitting Enter to continue. Across the top of the screen are three options: F1 Help, F2 File, F3 Options.

- **Hitting the F1 key brings down the following menu:**
  - Using the Keyboard: Explains the various keys necessary to play the game
  - Playing the Game: Gives a brief overview of the game
  - Overcoming Obstacles: Summary on how to avoid obstacles
  - Puzzles and Logic Problems: Explains how to collect and solve the puzzles.

- **F2 pulls down the following menu:**
  - Hall of Fame: List of the best players
  - List of Players: Current list of most recent players
  - Return to Map Menu: Brings you back to the map to change regions
  - Start New Game: Begin another game
  - Exit and Save.

- **Pulling down F3 shows the following menu:**
  - New User Message: You can turn off the new user messages here
  - Music: Turn the music on/off
  - Sound Effects: Turn the sound effects on/off.

- Along the bottom of the screen are graphics showing the following: Artifact Pieces (there are six slots for them); a small box displaying the current tool you are using (use

- the Enter Key to change the tool); and finally, a green bar denoting your energy level, a red bar telling you what region you are in, and Chamber bar telling you what chamber you're in.

- To play, move the man using the Arrow keys. The keys move him up, down, forward and backwards. You must jump across gaps, avoid cave creatures, and find the missing artifacts.

- When you gather all the six of the missing artifacts, you will be given a math problem to solve. Since I've never managed to get that far, I don't know what kind of problems you will get. This game is hard, and I thought I was fairly good at computer games. Good Luck. To exit any time during the game hit the Escape Key. The computer will ask you if you are sure you want to exit, select yes with Arrow Keys and hit Enter.

BRANDON

Age: 5-7 **Grade Level:** K-2nd **Topic:** Basic reading skills

Goal: To learn early reading skills such as capitalization, spelling, and word recognition.

To Play: Throughout this game you will need to use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape key** to quit in the middle of the game. To turn the sound on/off, press **Control "S"**.

Procedure:

- Press Enter to get to **Main Menu**. Main Menu consist of the following options: A. Important Information; B. Limited Warranty; C. Instructions; D. Catalog List; E. Free Software; S. Start Program Now; Q Exit to Dos Prompt. Ignore all of these options except S - Start Program Now. Hit "s" to begin the game.

- You can either hit "L" to start Brandon's Lunchbox, "B" to start Brandon's Boatbox, or "F" to start Brandon's Flashbox.

- **To play Lunchbox:** After selecting "L" for Lunchbox, you are given a number of letters to choose from. Each letter has a different game.
    - A asks you to match the lowercase letter to uppercase letter by typing it in on the keyboard.
    - B asks you to match the lowercase letter to the uppercase letter.
    - C is a matching game. Match the object displayed to those hidden behind the cards. Simply type the number on the cards to display what's behind them.
    - D asks you to count the pictures Enter the number using the number keys.
    - E asks you to complete number sequences by entering the missing numbers.
    - F gives you simply math problems to solve. Type the answers in using the number keys.

NOTE: **To escape any of the games hit the Escape key. Unfortunately, hitting the Escape key will not only exit you from the game you are currently playing, but it will exit you from the program entirely. You must re-select Brandon from the Anderson Menu if you want to play with Boatbox or Flashbox.**

- **To play Boatbox:** You are again given a number of letters to choose from - Letter A gives you a set of words to identify. If you know what the word is, hit the + key and you are rewarded. B, D & D all do the same thing only with more difficult words. Keep hitting the + key to get rewards.

- **To play Flashbox":** After selecting it, you are given four letters to choose from. Letter A gives you four words hiding behind cards. The computer first shows you where all fours words are, then gives you one of the words and asks you to type the number of the corresponding car. B, C, and D are exactly the same as A but with more and harder words added. Hit Escape to leave the game.

CHEMICAL

Age: 15-17 Grade Level: 11-12th Topic: Chemistry

Goal: Students are expected to select various elements and combine their atoms to form new elements. Basic knowledge of chemistry is necessary.

To Play: To begin, the first screen will ask you to select the monitor type. Select **EGA 640 x 350** by typing number **3** and hitting **Enter**. Enter your first and last name and hit **Yes** when it asks you if this is correct. Use the **Arrow keys** to highlight selections and the **Enter key** to select.

Procedure:

- The **Main Menu** consists of two option bars, one that runs across the top of the screen and one that runs along the right-hand side of the screen. To select any option, enter the first letter of each option. To repeat a command, hit the Enter key. Hit F1 for help.

NOTE: **Since Chemistry was not my best, or favorite, subject, I suggest reading the Help menu before attempting this program. Once inside the Help menu, use the Spacebar to scroll through the file. Hit Escape to exit Help. TO EXIT THE PROGRAM, HIT THE LETTER "Q". THIS IS THE ONLY WAY, BELIEVE ME!**

- **Here is a list of available commands and their functions:**

  - F1 - Displays the Help file
  - F2 - Displays tutorial on Chemical Bonding
  - F3 - Displays Examples of bonding
  - F4 - Displays Temp.Dat (Files called by (R)ead and (W)rite.
  - F9 - Number Atoms
  - F10 - Adds grid to Screen

Below is a brief description of each Option found along the top of the screen:

- A: for Atom displays a periodic table. Elements are selected by entering the one or two representations for that element followed by Enter.

- B: for Bond is used to bond two atoms. A list of all atoms selected is displayed and you can bond two atoms by hitting Enter.

- C: for Clear clears the screen and the buffer for all atoms and bonds selected so far

- D: Lists the atoms selected so far.

- E: Set Expanded View, moves atom number 1 to the center then shows view of atoms.

- FD: Delete a chemical file

- FM: Minimize Chemical File size by deleting unused orbitals.

- FP: Changes default directory or Disk

- G: This command is used to attach a group of atoms that were made using the Bond command.

- H: for Hybrid is used to combine electron orbitals into hybrids.

- I: for Ionize is used to ionize an atom.

- MA: for Move is used to manually move all atoms

- V: for View is used to show the view of the chemical that has been selected by the up/down cursors.

NOTE: **Hitting the Escape key will not clear any screen. To clear the screens, you must type "C". After clearing the screen, you can move between the top Options by using the Arrow Keys. To reach the Options on the right side-bar, highlight Setup and then use the Down Arrow key. Hit Enter to select any option. Finally, to be quite honest, I don't really understand this program. Those Science teachers out there, this is your area of expertise. Have fun! All others, stick to programs that are much less involved.**

DECISIONS, DECISIONS

Age: 10-17 **Grade Level:** 5th-12th **Topic:** Social Science

Goal: With the help of four advisors, students must evaluate conflicting data, facts, and opinions in order to decide social policy and the fate of one polluted pond.

To Play: Throughout this game, you will need to use the **Spacebar** to scroll through text and the **Enter key** to make selections. Use the **Arrow keys** only when noted. There is no sound in this game. To escape the program is a little tricky. You must scroll through the text until you reach the screen that says "To Continue, press Enter." At this screen, you can **type Q** to return to the introductory graphic. Hit any key to return to the **Main Menu**. Once there, **type 4** to quit

Procedure:

NOTE: Decisions, Decisions is an interactive computer game that is meant to be played within a classroom environment. Students are meant to work in groups or with the teacher. Also, the game comes with several guidebooks that are used to help students decide which decisions to make. Since you are probably working alone and do not have the guidebooks, this game cannot be fully utilized. I will give you a brief introduction so you can get a sense of how to use it in a classroom.

- Hit Enter to begin. The **Main Menu** has four Options: 1. Start a Simulation, 2. Resume a Simulation, 3. Delete a Class, and 4. Quit.

1. **Start a Simulation:** After typing 1, enter the name of your class or group by typing it on the keyboard. Hit enter. Now, choose either 1 for the Whole Class or 2 for Multi-Teams. I suggest choosing 1. Now, use the left-right Arrow keys to choose the number of students in your class. Choose any number and hit Enter. Type S for Screen display. Hit Enter to continue. A short introduction to the game begins. Hit the Spacebar to scroll through it. After the introduction, the computer will ask you what your goals will be. To continue, press Enter. The computer will ask you to pick your most important goal. Choose among four options by typing the letter. The computer will continue to ask you to choose your goals until you have prioritized all four options. Hit Enter to continue. Next, the computer will ask you what you should do to achieve your goals. Hit Spacebar to scroll through the text. After the list of options, hit Enter to continue. You are asked to choose what you plan to do to help the polluted pond. Choose between three options by typing the corresponding letter and hitting Enter. Next the computer will ask you to make another decision based on your previous decision. Making decisions is the basis for this game. You can continue on for a long time simply deciding which actions are best.

2. **Resume a simulation:** Allows you to continue a previously saved simulation.

3. **Delete a Class:** Allows you to delete a previously saved simulation

4. **Quit.**

GOOGOL MATH

Age: 7-12 **Grade Level:** 3rd-7th **Topic:** Math

Goal: Students are expected to solve basic math problems ranging from addition to division while maneuvering around various obstacles and video challenges.

To Play: Throughout this game you will need to use the **Arrow keys** to highlight selections and move various objects. To select, use the **Enter key**. Depending on the game, you will also need to use the **Spacebar**. To escape, hit the **Escape key** and **type Y** for yes when it asks you if you want to quit.

Procedure:

- **To play**, hit Spacebar to begin. First type in your name and press Enter. The **Main Menu** consists of five Options: Googol Climber, Googolpede, Googolvaders, Bonus Disk Info and Quit. Use the Arrow keys to make a selection and hit Enter.

- **Googol Climber:** To play, highlight with the Arrow keys and press Enter. You are given the following instructions: Use the left and right Arrow keys to move, and the Up and Down Arrow keys to jump to a higher floor. You must find the correct answer to the problem given at the bottom of the screen and jump up to hit it. Don't hit the wrong answer and don't hit any of the rolling balls. Also, don't bump your head on the above floors. You will die and must start over. Hit Spacebar to continue play. You must now select what subject you want to play. You can choose from Addition, Subtraction, Multiplication, Division, Add & Subtraction, Multipy & Divide, and All Four. Use the Up & Down arrows to make your selection. Use the Left-Right Arrow keys to choose between Slow, Medium, and Fast. I suggest Slow to start out with. After making your selections, hit Enter. A problem appears on the bottom of the screen. Determine the answer and then locate the answer on the screen. Move your man to that answer and once beneath the answer, jump up to hit it. To escape, hit the Escape key and type Y to Quit.

- **Googolpede:** To play, select with the Arrow keys and hit Enter. You are given the following instructions: Use the four arrow keys to steer. Hit "T" if the equation is True and "F" is the equation is False. Hit the bonus blocks for extra points. Don't hit the wrong answers. Don't hit the walls and don't hit yourself. After reading the instructions, hit the Spacebar to continue. Again, you must choose your subject and what level to play the game at. In this game, use the Arrow keys to move the flashing block to the subject and level you want to play the game at. Once the block is placed in the desired square, hit Enter. I suggest choosing a level under 5 because this game is somewhat difficult to manuvere. Once the game starts, look at the equation on the bottom of the screen. Determine if the answer is true or false. Once you have determine the answer, use the Arrow keys to steer the centipede toward the answer on the screen. Run the centipede into the answer. Don't run into walls because you will die.

- **Googolvaders:** To play, select with the Arrow keys and hit Enter. You are given the following instructions: Use the Left-Right Arrow keys to move, then shoot the correct number at the incomplete equation. Use the number keys at the top of the keyboard to fire the correct answer. Press 1 through 9 to shoot 1 to 9. Press 0 to shoot a 10, press - to shoot an 11 and press = to shoot a 12. Hit Spacebar to continue. Again, you must choose your subject and a level. Use the Arrow keys to move the flashing block to the subject and level you want to play the game at. Once the block is placed in the desired square, hit Enter. I suggest choosing a level under 3 because this game is somewhat difficult to manuvere. To play, an equation appears at the top of the screen. Determine the answer and then select the correct number key to shoot that answer at the equation. Make sure the boat is underneath the equation you are solving before shooting the answer at it. The object is to shoot all the equations so they don't crush the boat at the bottom of the screen. Hit escape to quit.

- **Bonus Disk Info:** Provides information on how to obtain additonal games. Ignore

- **Quit:** Select this and hit Enter. Type Y to Quit. You must allow the computer to play it's little scene before it quits.

NOTE: YOU CANNOT TURN THE SOUND OFF THIS GAME!

THE MARKETPLACE

Age: 8-14 **Grade Level:** 4th-9th **Topic:** Math

Goal: Students are expected to sell apples, plants or lemonade using basic math skills to figure out profit, costs, and income.

To Play: Throughout this game, use the **keyboard** to make selections and the **Enter key** to choose. Use the **Spacebar** when noted to scroll through screens. To escape, hit the **Escape key** and **type Y** for yes when it asks you if you want to quit. To exit, **type 6** from the **Main Menu** and hit **Enter**. The game may take you back to a DOS prompt. If this happens, type **"menuhelp"** and this will bring you back to the Anderson Lab menu.

Procedure:

- The **Main Menu** consists of six Options: 1. Sell Apples, 2. Sell Plants, 3. Sell Lemonade, 4. General Information, 5. Turn Sound On, 6. End.

- **Sell Apples:** To play, type 1 and hit Enter. Press the Spacebar to continue. The game will ask you if you want instructions. You can type Y if you want to, but it's not necessary. Type N to continue and hit Enter. First, type in your name. The computer will ask you if you like the way it looks on the sign. Type Y for yes and hit Enter. Now, the computer will ask you how much you want to sell your apples for. Type a number under .25 cents and hit Enter. The day will progress and your apples will be sold. Hit Spacebar to continue. The computer will tell you how many apples you sold. Hit the Spacebar. Next, it will tell you how much income you made. Hit the Spacebar to continue. Now it's your turn to figure out how the computer determined the income you made. Hit the Spacebar. To determine the income, type in the price of the apples. Make sure you include the decimal point! Hit Enter. Now, type in the the number of apples sold and hit Enter. The computer flashes the income on the screen. Press Spacebar to continue. Choose a new price for the apples and type it in. Hit Enter. The computer will ask you to make a prediction. Will you make less income, more income or the same income as yesterday?. Use the Arrow keys to make your prediction and hit Enter. The day progress and you sell apples. Hit Spacebar to scroll through the screens. If your prediction was accurate the computer congratulates you, but tells you that you could have made more money with a different price. Once again, you must figure out the day's income. Follow the above procedures. The computer will then ask you what price made the most money. Type in the price and hit Enter. Hit the Spacebar to see the graphic sales report. Hit Spacebar to continue. The whole process repeats itself until you have obtain the optimal price for selling apples. To escape hit the Esc key twice. The computer will ask you if you want to sell apples. Type N for no and hit Enter.

- **Sell Plants:** Type 2 and hit Enter. Hit Spacebar to continue. Type N for no when it asks you if you want instructions and hit Enter. The scenario in this game is different from that of selling apples. First of all, the computer decides what price to sell your plants at. Hit the Spacebar to continue. Now, after hitting the Spacebar, you must

figure out the daily profit. You first enter in the price of the plants and hit Enter. Then, you enter in the number of plants sold and hit Enter. The computer figures out the income. You hit the Spacebar. Next, enter in the number of plants sold and hit Enter. The computer enters in the cost of each plant and you are given the expense for all the plants sold. Hit the Spacebar and now enter in the income you made off the plants and hit Enter. Now, enter in the expenses and hit Enter. The computer gives you the daily profit. Now you are ask to try advertising to help sell your plants. Each sign will cost a particular amount. You have a choice of slogans and how many signs you want. Make the selection by typing in the appropriate number and hitting Enter. Your plants begin to sell. You again must figure out the daily profit taking into account the price of the signs. To escape, hit the Escape key twice.

- **Sell Lemonade:** Type 3 and hit Enter. Hit the Spacebar. Type N for no when asked for instructions. Hit Enter. Type N when asked if you want to continue a saved game and hit Enter. In this game you are asked to choose how many lemonade stands you want. Make your selection and hit Enter. Now, you must enter in the names of each of the stands you chose. You must also choose an adjective used to describe your lemonade. Make a selection and hit Enter. Repeat this process for all of your stands. Hit the Spacebar to continue. This game presents you will the most options of all. You must decide how many glasses to make, how much to charge for each glass, how many signs you want to make. You have $4 dollars to begin with, and all your choices will take away from your original amount of money. Simply follow the prompts as you play. To escape, hit the ESC twice and type N when it asks you if you want to sell lemonade. Hit Enter.

- **General Information:** Gives you a brief synopsis of each game.

- **Turns the sound On:** Ignore this key.

- End

MINER'S CAVE

Age: 8-12 **Grade Level:** 3-8 **Topic:** Science/Simple Machines

Goal: Students search for lost treasure in eight unique caves and then determine which simple machine will be the most effective in transporting the treasure.

To Play: Throughout this game you will need to use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape** key to quit in the middle of the game. To turn the sound on/off, press **Control "S"**.

Procedure:

- The Main Menu consists of four options:
  1. **Information:** Under this option there are four more options:
     - About Miner's Cave: Gives a brief scenario of the game. Tells about the four machines and discusses force and load.
     - See How the Machines Work: Gives a demonstration of each machine.
     - Hall of Fame: Track record of all the top players.
     - Teacher Information: Gives the names of the game's creators.
  2. **Miner's Apprentice:** A practice mode to learn all the machines.
  3. **Master Miner:** The complete game. You should play only after practicing with Miner's Apprentice.
  4. **Quit**

- To play, select Miner's Apprentice. First, enter your first and last name. The computer will ask if you spelled it correctly. Select Yes and hit Enter.

- Next, a brief overview will appear where you can practice using all four machines to raise loads of treasure. Each practice mode consists of ten tries.

- You can choose the machine you want to explore by selecting the following numbers: 1. Ramp, 2. Lever, 3. Wheel & Axle, 4. Pulley

- Once you select a machine, a new screen will appear showing a cave, a cart of treasure, and the machine. At the bottom of the screen are the words **Load, Advantage, Try** and **Esc**. **Advantage** allows you to change the length of the ramp, the placement of the lever, the size of the wheel, or the number of pulleys. It all depends on which machine you select. **Load** allows you to increase or decrease the amount of jewels in the cart. Use this in combination with **Advantage** to determine the optimal Load and Advantage needed to transport the cart up the hill.

- Use the Arrow keys to select either Advantage or Lever. When Advantage is selected, use the Up and Down Arrows to increase or decrease the advantage of whatever machine you are working with.

- When using Miner's Apprentice, you get 10 tries to successfully transport the treasure. After 10 tries you are no longer an Apprentice, but a Master

- Hit Escape to get back to the main menu. Then, select Master Miner to play the full game. The goal in Master Miner is to lift as much treasure as possible using the optimal Advantage and Load. Each room gives you a specific amount of force. You earn points for each Load you lift, the heavier the load, the more you earn. Beware, you will also lose points if you try to lift a load and it's too heavy. Each time you want to lift a load, you must choose a machine for the task. After choosing the machine, select Advantage, select Load, then select Try. If you succeed, a new screen appears. If you don't succeed, you must try, try again.

MYSTERY MATTER

Age: 7-13 **Grade Level:** 3-7th **Topic:** Science/Properties of Matter

Goal: Students use a variety of tools to test unknown matter for certain physical and chemical characteristics and then use the information to identify the mystery matter.

To Play: Throughout this program use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. **Press the Escape key** to quit. To turn off the sound, hit **Control "S". NOTE: This game is very involved!**

Procedure:

The **Main Menu** consists of four Options: 1. Information, 2. Matter Search, 3. Matter Maker, 4. End.

1. **Under Information you have four additional Options:**

- **Instructions:** In Matter Search you identify a piece of matter by testing for its special properties. By using the Matter Maker program you can look at each chemical and create your own mystery matter for others to look at. In Matter Search, the robot-like laboratory contains several tools that you can use to learn about your mystery matter. For example: Water - tests for solubility, Heat - tests for boiling point, Cold - tests for freezing point, Magnet - tests for magnetic attraction, Light Bulb - tests for electrical conduction, Litmus Paper - tests for acid/base level, Water Beaker - tests for density compared to water.
- **See the Robot Lab:** Shows you the laboratory. The lab consists of a machine with several options: Test, Compare, Name, Review, Quit. Hit Enter and you can use water, heat, cold, magnet, conductor, pH, and density. Escape returns you back to the Information Menu.
- **Teacher Information:** Refers you to the manual and gives you the names of the game's creators.
- **Return to Main Menu**

2. **Matter Search:**

- **To play**, enter your first name, last name, and Yes for when it asks you if you spelled it correctly.
- Pick the kind of matter you want to work with: Choose from Easy Matter, Medium Matter, and Hard Matter
- 21 chemicals have been placed in the robot lab. Try to find out which one of the chemicals is your mystery matter.
- Use either the Test, Compare, Name, Review or Quit options.
- Test: You are given the state of your matter. For example, a liquid. You have seven samples only to work with. Test each sample by selecting each test with the Arrow keys and hitting the Enter key. Begin with Water and work down the list. Remember the test results! You will need to enter them in the Compare menu.

- Compare: Choose either 1. Enter Test Results, or 2. See Chemicals that Match. First choose 1. Beginning with the State, hit the Enter key, select the result that matches your previous test (use Arrow keys to select), hit Enter. Begin to enter information the same way in all the categories. Repeat this process with all the other 8 choices. Now, hit the Escape key and select 2. See Chemicals that Match. The computer will tell you what your liquid is. You can use the Arrow keys to scroll down to learn all about your chemical. After reading, hit the Escape key twice to return to the lab options.
- Now, select Name to enter the name of your matter. Hit Enter and from the list of substances, find the matching matter by scrolling down the list using the Arrow keys. When you find your choice hit Enter. You will be congratulated. Hit the Spacebar. You can now get a new matter, change the level, or return to Main Menu.
- Anytime during the game you can hit the Review key to remind you of the properties you have already tested.
- Quit allows you to continue testing your matter, get a new matter, change level, or return to Main Menu.

3. Matter Maker

- Under Matter Maker there are three more Options: See Matter, Make Matter, and Return to Main Menu.
- See Matter: Allows you to choose from 1. Solids A-M, 2. Solids N-Z, 3. Liquids, and 4. Gases. If you enter any of these numbers, it gives you a list of the elements. Select an element using the Arrow keys. Hit Enter and the computer gives you the composition of the element. Hit Escape twice to return to Matter Maker Menu.
- Make Matter: The laboratory is ready for you to make your Mystery Matter. Hit Enter. Type the name of your matter. Hit Enter. Type the formula for your matter. Hit Enter. What is the status of your Mystery Matter?: Element, Compound, Solution. Select one and hit Enter. What is the physical state of your Mystery Matter?: Liquid, Solid, Gas. Select one and hit Enter. What is the density of your Mystery Matter?: 0-99. Select one and hit Enter. Answer all the necessary questions in such a matter until all the information is complete. You have now created a new Mystery Matter.

4. End: Select this option to leave the game

MYSTERY OBJECTS

Age: 6-8 Grade Level: 2-4 Topic: Physical Traits and Properties of Objects

Goal: Students develop inquiry-process skills as they use "Data Snoopers" to test hidden objects.

To Play: Throughout the program, use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. **Press the Escape key** to quit in the middle of a game. To turn the sound on/off, **press Control "S"**.

Procedure:

- The **Main Menu** consists of four options:

  1. **Information:** Under information are four different features:
     - **Instructions:** Show you a series of screens which explain the operation of the game.
     - **See an Example:** Shows you a sample problem and the different tools used.
     - **Teacher Information:** Miscellaneous information for teachers. Ignore.
     - **Return to Main Menu.**
  2. **Practice Sessions:** Students are asked to identify a mystery object that is hidden among three distracter objects.
  3. **On Your Own:** Full game where students must identify an object from among five distracter objects.
  4. End

- To play, first you will see a group of objects that are very different, either by shape, size or smell. One of these objects will be hidden in a box. Your job is to name the object. You have several DataSnoopers to help you:
  - Funny Feeler - tests for texture
  - Sizerupper - tests for size
  - Heavyholder - tests for weight
  - Supersniffer - tests for smell
  - Seeshaper - tests for shape
  - Colorseeker - test for color

- To begin, select On Your Own. First type in your first name, your last name and select Yes if it is spelled right. Hit Enter
- You are next offered three choices for game difficulty: 1. Easy Objects, 2. Medium Objects, 3. Hard Objects. I suggest Hard Objects because this game is very easy.
- Next you are given six hard objects (for example: Hook, Ice Cube, Nail, Snowflakes, Plate, Cup). Hit Spacebar.
- Use Arrow keys to select the DataSnoopers. After selecting one, press Enter. The Data Snoopers give you their findings. If you know the object, you can then select Name and choose the object. If you are right, you are then given the option of 1. Get a New Object, 2. Change Level, 3. Return to Main Menu. You can choose to keep playing, or return to the Main Menu where you can exit the program.

OPERATION NEPTUNE

Age: 10-14 **Grade Level:** 5th-9th **Topic:** Math

Goal: Students search underwater for pieces of a missing canister while trying to avoid deadly sea creatures and solving mathematical equations.

To Play: In this game you use the **Arrow keys** to move the submarine and the **Spacebar** to fire ink pellets. Use the **Enter Key** and the **Number Pad** when solving equations. The first thing to do is hit **Control "S"** to remove the sound. Secondly, if the List of Players is full, you must delete a name. After selecting a name, hit **Enter** to continue. When it asks if you are sure you want to delete a name, choose **Yes** with the **Arrow keys** and hit **Enter**. To exit, hit **F2** and select **Save/Exit**.

Procedure:

- Before the game begins you must watch a brief history of the mission. The summary tells you that you must gather together pieces of a secret canister which broke apart on the ocean floor. To avoid this history, hit Enter.

- Select Start a New Game and hit Enter. Type in your first name, hit Enter. The next screen will ask you to choose your Game of Choice. Choose Voyager Game.

- On screen will be a submarine submerged in the ocean. Along the top of the screen is a list of the available options. F1 is the Help button, F2 is the File button, and F3 is the Options button.

  Under F1 is the following:
  - **Playing the Game:** Gives you brief instructions on how to play.
  - **Keyboard:** Describes the various keys you will need to play the game.
  - **Zones and Sectors:** Talks about the various zones you will visit.
  - **Performing Calculations:** Tells you how to use the Key Pad.
  - **Using the Calculator:** Further instructions on how to use the Key Pad.

  Under F2 is the following:
  - **Hall of Fame:** Best players list of names
  - **List of players:** Current list of people who last played the game
  - **Start new game:** Allows you to start over.
  - **Save and Exit**

  Under F3 is the following:
  - **New Player Message:** Gives you the option of having the computer give you helpful messages. I suggest selecting this option.
  - **Sound effects:** Turns the sound on or off.
  - **Customization:** Customize the math problems to a text book. Ignore.

- To play, navigate the sub using the Arrow keys. Avoid all sea life. If they are blocking your way, shoot them with an ink pellet and sneak by them. Watch the light

on the top of the sub. When it flashes, hit Enter. You will then be asked to solve a problem. Use the Key Pad on the keyboard to solve the problem. Make sure the Number Lock key on the upper left-hand corner of the Key Pad is lit.

- As you travel around the screen, look for pieces of the canister. The pieces will be flashing. Touch the canisters with the sum to pick them up.

- You lose oxygen every time you touch a sea creature. If you lose all of it you must start over. You can get oxygen from the dolphin's back. Don't avoid the dolphins!

- When you collect a data canister, you must solve a problem to break the access code. Once the code is broken, you can read the secret information. After reading the information, use the Arrow keys to select Done. Hit Enter.

- When you get to the Ship, you must solve the hatch combination. Three wheels will spin. Watch the bar underneath as a equation appears there. When the equal sign appears, you will be asked to solve the problem. The three wheels will spin again. When the correct answer lines up with the arrow, hit the Spacebar. You can now enter the sub.

- You receive congratulations and can now begin the next sector.

THE OREGON TRAIL

Age: 10-Up **Grade Level:** 5th-11th **Topic:** History/Social Science

Goal: To successfully complete the hazardous journey across the Oregon Trail.

To Play: Throughout this game you will need to use the **Arrow keys**, the **Enter key** and the **Spacebar**. If you are unsure which to use at any time, look for instructions at the bottom of the screen. You can turn the sound off or on anytime during the game by hitting **Control "S"**. To escape the game, hit the **Escape key** two or three times until you get back to the Main Menu. Once there, type **6** and hit **Enter**. **DO NOT SAVE YOUR GAME.**

Procedure:

- After entering the game, the main menu will appear with the following options available:
  - **Travel the Trail:** This begins the game
  - **Learn about the Trail:** Gives a brief history of the Trail
  - **See the Oregon Top Ten:** Gives the Top Ten Best Players
  - **Turn the Sound Off:** Sound should already be off.
  - **Choose Management Options:** For classroom teachers only. Ignore.
  - **End:** Exits the game. Hitting the escape key will bring you here.

- Choose **Travel the Trail.** The next screen will ask you to choose a character. You can be a Banker from Boston, a Carpenter from Ohio, a Farmer from Illinois or find out the differences between the choices. Type your choice and hit Enter.

- Type the name of the wagon leader (your own preferably). Hit Enter.

- Type the names of the four other members in your party. Hit Enter after each entry.

- The game will ask if the names are correct. Select Yes and hit Enter.

- Select the month to leave Missouri. Type # of choice and hit Enter.

- You must buy supplies with $800 in cash. Hit Spacebar to see Inventory. Scroll through the story by hitting the Spacebar. Eventually you come to the items. Choose items by their number. Type the # and hit Enter. Follow the prompts. Decide where and how to spend your $800. Decide wisely, do not randomly select goods. Press Spacebar to leave the store after purchasing all your items. Press Spacebar twice more to get to Options Menu.

- Options Menu allows you to choose from the following:
  - **Continue on Trail:** Begins the game.
  - **Check Supplies**
  - **Look at Map:** Lets you see your position on the trail.
  - **Change Pace:** Change pace from Steady to Strenuous to Grueling.

- **Change Food Rations:** Change from Filling to Meager to Bare Bones.
- **Stop to Rest:** Can rest for a selected period of days, your choice.
- **Attempt to Trade:** Meet travelers who are willing to trade.
- **Talk to People:** These people give good advice, listen to them!
- **Buy Supplies:** Can replenish supplies when low. Watch your money.

- To play the game: After you have bought your supplies. You select **Continue on Trail**. Your wagon will move until it reaches its destination. Along the way, disasters may occur which will interrupt your trip. After each destination is reached, select Look at Map to see your location. Make sure to change your pace and food rations every so often so you don't use too much food or energy getting someplace. At each location, make sure you talk to people. They give you good advice about the Trail. Be conservative with your money. Supplies go quick and you will need every last bit of money. Basically, the game will guide you in your decisions. Have fun and explore.

PCGLOBE

Age: 7-17 **Grade Level:** 3rd-12th **Topic:** Geography

Before playing PCGLOBE, you must find it. First, you must exit out of Education Class Assignments by hitting the Escape key. Now, either highlight or type the corresponding number to Other Class Assignments. Hit Enter. Highlight #13 - PCGlobe and hit Enter.

Goal: To learn about the world's countries. Gives detailed descriptionsof land formations, populations, cities, national flags and anthems.

To Play: Throughout the program, use the **Arrow keys** or the **Mouse** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape key** or **left mouse key** to return to the menu bar. To exit, pull down the File menu and select Exit.

Procedure:

NOTE: PCGlobe is not a game per se. It is an educational program that allows you to learn about the countries of the world. It is very involved and allows for a lot of freedom to explore. I will briefly describe the features below, but it is up to you to explore on your own.

- To play, hit Enter. Across the top of the screen are the following options: Help, File, World, Region, Country, Database, Utilities.

Help	File	World	Region	Country	Database	Utilities
Using menus	Output Data	World Map	Active Contin.	Active Ctry	Active Ctry.	Change Para.
File	View PCX	Select Contin.	Select Contin.	Point & Shoot	Point & Shoot	City Distance
World	Save PCX	Select Group	Select Group	Select Ctry	Select Ctry.	Currency
Region	View ASCII	Active Ctry.	Active Ctry	Base Map	Data Screens	Time Zones
Country	Print Screen	Point & Shoot	Point & Shoot	Major Cities	Comparison	Country Flags
Database	Exit	Select Ctry.	Select Ctry	Elevations	Theme Maps	Change Color
Utilities		Select City	Select City	Features		
		Change Color	Change Color	Flags-Anthem		

- You can obtain amazing amounts of information from this program. Since there is no set procedure, I cannot write a list of instructions to follow. My suggestion is to simply explore each of the options. Use the Mouse to highlight options, and the left button to activate. Use the Escape key to return back to the Main Menu options. Escape will always get you out of the Option you are currently in and return you to the Options bar above. This is a wonderful program that provides more information than you could ever imagine. Have fun.

- To escape, highlight the file Menu and select Exit. A new menu will appear. Select Exit again and hit Enter.

READER RABBIT

Age: 3-7 **Grade Level:** K-2nd **Topic:** Basic reading skills

Goal: Students can build basic reading skills by playing four interactive games, with each game focusing on a particular reading skill.

To Play: First, hit **Control "S"** to turn off sound, then hit **Enter** to begin. Throughout this game you will need to use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape key** to quit in the middle of the game.

Procedure:

- The **Main Menu** consists of four games: 1. Sorter, 2. Labeler, 3. Word Train, 4. Matchup Games. Press the number to begin any game. Press F1 for Help any time during game.

1. **Sorter:** The goal of the game is to pick words that have the same letter in the same place as the one shown on the Sorter Machine.
   To play, hit the Enter key twice to place the word on the shelf. Press the Down Arrow twice to drop the wrong words into the garbage can. You can change the letter position and the letter in the Sorter Box by using the left and right Arrow keys to change the position and F3 to change the letter. You can also change the speed by typing either 1, 2 or 3, with 3 being the fastest speed.

2. **Labeler:** The goal of this game is to unscramble letters to spell out words.
   To play, use the left and right Arrow keys to move to the letter which begins the name of the pictured object. Use the Arrow keys to place the letter in the box beneath the picture and hit Enter twice to place the letter. Continue to gather letters until the entire word is spelled out under all three pictures. Press F3 to see the names of the picture sets and type the number of your choice.

3. **Word Train:** The goal is to make a train of words.
   To play, add words that differ by only one letter from the previous word on the train. Use the left and right Arrow keys to move the pointing hand to the word you want, then press Enter to choose it.

4. **Matchup Games:** Under this game, there are six different versions, each one a little more difficult than the other. The goal of all six games is to find pairs of pictures, words or letters.
   To play, use the Arrow keys to move the hand to your choice and press Enter to choose. Then move the hand again to try and find the match. If no match occurs, you must choose two more cards.

- You can hit the Escape key at any point to exit the game. When it asks you if you are sure you want to leave, select Yes and hit Enter.

SCHOOL MOM

Age: 5-7 Grade Level: K-2nd Topic: Basic reading skills

Goal: Students are introduced to a variety of subjects such as Music, Art, Spelling, and Math. Each subject is carefully described by the computer and allows the student to practice the skills taught.

To Play: Throughout this game you will need to use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape key** to quit in the middle of the game. To turn the sound on/off, press **Control "S"**.

Procedure:

- Hit Enter to get to **Main Menu**. The Main Menu consists of nine options: Music, Art, Spelling, Math, Exams, Time, Registration, End. Each option is detailed below:

- Music: To play, select Music by highlighting and hitting Enter. Choose from three different levels and hit Enter. Level One allows you to create songs by typing individual notes on the keyboard. You can use the Arrow Keys to change the octave of each note. Use the Spacebar to create a space on the scale. Use the Backspace to erase a note. To play your tune, hit Enter. To start a new tune, press "N". To quit, hit Esc.

- Art: To play, after selecting Art you must choose from five categories: Draw, Spider Webs, Space Tunnels, Space Worms, Space Ribbons.
  - **Draw** allows you draw on the screen by pressing "p" to raise/lower the pen, "e" to erase, and "c" to change the color. Hit escape to quit.
  - **Spider Webs** allows you to make small webs by hitting the greater than/less than keys, < >. You can erase the webs by hitting "e", and change their colors by hitting "c".
  - **Space Tunnels** allows you to create small tunnels across space. You control the direction of the tunnels with the Arrow keys. You can change their color ("c"), make them bigger ("g"), smaller ("r") and change the speed (< >). To erase hit ("e").
  - **Space Worms** and **Space Ribbons** are exactly like Space Tunnels only you draw worms and ribbons instead of tunnels.

- Spelling: To play, select spelling and you can choose from Alphabet, Random Words, New Spelling HW, Last Spelling HW, Old Spelling HW.
  - **Alphabet** asks you to match uppercase letters with lowercase letters by selecting the correct letter using the Arrow keys. Press Enter once you selected the right letter.
  - **Random Words** first asks you to choose from Four Levels. Then, the computer gives you a word and asks you to spell it by typing it on the keyboard. Hit Enter when done.
  - **New Spelling HW** first asks you how many words you want to enter up to thirty. You enter words by typing them into the designated slots and hitting

SPANISH TUTOR

Age: 12-17 **Grade Level:** 7th-12th **Topic:** Language

Goal: Students are drilled on Spanish verbs, nouns, and phrase. Each student is given a specific numbers of words and have the option of translating from English to Spanish or Spanish to English. Allows teachers to create specific Spanish exams.

To Play: Throughout this game, use the **keyboard** and the **Enter key** to make selections. To escape, **type X**. The computer will ask you if you want to change your choice from English to Spanish or vice versa. Just **type X** again to exit.

Procedure:

- Press Enter to begin. The **Main Menu** consists of 19 different options. A - F are all word drills. G gives you the option to retest the words you missed during the drills. H gives you the diagnostic results of your tests. I - N allow you to print the various tests. O - P allows you to edit the tests. Q - R allows you to modify the timing defaults and the printer. S - allows you to look up various vocabulary words.

- **To play**, type the letter of the drill you want to practice. The computer will ask you if you want a multiple choice type quiz. Type Y for yes. (If you type N for no, the drill is slightly different. Instead of choosing from four options, you must type in the word that matches the given word. Much more challenging for people with a good grasp of Spanish)

- It will then ask you if you want English to Spanish or Spanish to English. Type either E or S depending on your preference.

- The drill will then give you a word on the top of the screen and four answers below it. Choose the number which correctly matches the word. Simply type the number of the correct choice. The computer will tell you if the answer is correct. If it is, hit any key to get the next word. If the answer isn't correct, the computer will tell you the correct answer. Again, hit any key to get the next word. Throughout the drill, the computer will record your total correct answers and give you a percentage. Make sure you answer the choices quickly because you are being timed.

- All the drills follow the same procedure. The other options on the Main Menu are not important and can simply be ignored. I do not suggest printing out drills because it uses a lot of paper and takes away printer time from other students.

Enter. To enter the words hit F1. Then the computer asks you to spell the words you just enter using the same procedure as before.

- **Last Spelling HW** gives you words previously entered as does Old Spelling HW.

- **English:** To play, select English. The computer asks you to choose a level from 1 to 4. After selecting a level, the computer will give you a brief grammar lesson. Level Four begins with plurals and possessives. Proceed through the lesson by hitting the Spacebar. After the lesson, you must answer questions. Select the correct answers using the Arrow keys and the Enter key.

- **Math:** To play, select Math. The computer gives you six options to choose from: Laser Blast, Bug Numbers, Applespider, Addition & Subtraction, Multiplication & Division, Pre Algebra Math.
  - **Laser Blast** is a counting video game. You are asked to count the number of blocks shown in a picture below. Then, a number will begin to float across the screen. When the number matching the number blocks goes by, you must shoot it using the Spacebar.
  - **Bug Numbers** gives you three pictures and asks you to count the number of bugs in each picture. Type the number above the picture and press Enter.
  - **Applespider** asks you to keep your apple away from the spider by solving equations at the bottom of the screen. You can choose from Addition, Subtraction, Multiplication or Division by typing the first letter of each category. Use the Arrow keys to move the apple. Everytime you solve a problem correctly you get additional moves.
  - **Addition & Subtraction** asks you to choose a level from 1 to 4. After selecting, you are given problems to solve, both regular numbers and decimal numbers. Type the answers using the keyboard and hit Enter to go to the next problem.
  - **Multiplication & Division and Pre Algebra** are the same as Addition & Subtraction.

- **Exam** allows the teacher to make exams to give to her students. The students can take the exam and the computer keeps track of the scores.

- **Time** asks you to choose from four levels. After selecting, you are presented with a clock. You must match the time on the clock with the times written along the side of the screen. Use the Arrow keys to select the correct time. Hit Enter to make selection.

- **Registration** just asks the teacher to register her school with the company.

SPELLBOUND

Age: 7-12 **Grade Level:** 2nd-7th **Topic:** Basic reading skills

Goal: Students are taught basic spelling skills through the use of various techniques which allows them to match, pickout, and duplicate numerous words.

To Play: Hit **Control "S"** to turn off the sound, then press **Enter**. Press **Enter** to sign-up, then press **Enter** to Start New Game. If sign-in list is full, hit **Enter** to continue. A menu will appear asking you if you want to remove a player's name. Select **Yes** using the **Arrow keys** and hit **Enter**. **DO NOT SAVE GAMES**. Now, hit **Enter** to start a new game.

Procedure:

- To play, type in your first name and hit Enter. Now you must choose a topic. You can choose Everyday, Games, Places, Holidays, Fun, Word Wise, U.S., Nature, People, Grab Bag, My Topic. Each topic has a subtopic that describes the type of word lists you will have. Use the Arrow keys to highlight a topic, press Enter. Select the difficulty of the spelling. Can select Easy, Medium or Hard. I suggest Hard. This game is for kids, remember! Hit Enter after selecting.

- Across the top of the screen are three menu options: F1 for Help, F2 for File, F3 for Options.

- F1 Help contains the following items:
  - **Playing Spellbound:** Gives you a brief synopsis of how to play and the rules and score that you must follow.
  - **Word Search, Flash Card, Criss Cross, and Spelling Bee** all describe how to play each individual game.
  - **Customizing topics:** Describes how to select topics from the Main Menu at the start of the game.

- F2 Contains the following options:
  - **Customize Topics:** Can change the topic of your word search.
  - **Start New Game:** Allows you to begin a new game.
  - **Exit and Save.**

- F3 Contains the following options:
  - **New Game Message:** Can choose to have the computer give you helpful hints
  - **Voice:** Can turn the voice on/off.
  - **Sound:** Can turn the sound on/off.

- To play, you must first choose between four different games: Word Search, Flash Card, Criss Cross, and Spelling Bee. If you select New Game Message, a screen will appear telling you what to do.

- In Word Search you must use the Arrow keys to find words hidden in the puzzle. Use the Spacebar to pick or unpick letters. All the letters must connect.

- In Flash Card you must spell words that are flashed or scrambled. Use the Spacebar to flash a word again and the Keyboard to spell the word.

- In Criss Cross you must fit the words into the Criss Cross puzzle. Use the Arrow keys to move. Then type in the word. Use the Spacebar to remove letters.

- In Spelling Bee you must reach the Target score before you can play the game. Once the score is reached you spell the words that are flashed or spoken to you. Anyone who spells a word wrong is out.

- To exit the game, hit the Escape key, and select Yes when it asks you if you are sure you want to leave.

STORYBOOK WEAVER

Age: 5-8 **Grade Level:** K-8 **Topic:** Writing Tool/Language Arts

Goal: Students incorporate the art of writing, reading and illustrating to create their own stories.

To Play: After selecting this game, the computer will ask you to choose a graphics mode. Select **VGA 320 x 200 256** color and hit **Enter**. The next screen will ask you to select sound. **Select No Sound** using the **Arrow keys** and hit **Enter**. This game uses the **Mouse**, so once it starts you will no longer need any other keys. To escape, click on the word **File** in the upper left-hand corner and pull down the menu. Click on the word **Quit**. Game will end. **NOTE:** This is a detailed game with a lot of menu options. This outline will only give you a brief summary of the features.

Procedure:

- The **Main Menu** is broken into many Options. Across the top of the screen is a group of options with pull-down menus. Clicking on each will pull down the following screens:

FLE	EDIT	GOODIES	TYPE	HELP
New	Undo	Bring to Front	Choose	Help Options
Open	Cut	Send to Back		
Close	Copy	Restore Color		
Save	Paste	Ideal Size		
Save As	Clear	lothing Color		
Revert to Saved	Select All	Skin Color		
Preferences		Delete Page		
Program Sound		Insert a Page		
Printer Setup		Copy a Page		
Print		Swap Pages		
Quit		Go to Page		
		Add Music		

- There is not enough space to describe each feature, but many are self-explanatory. Play around with all the Goodies once you feel comfortable with the game.
- The rest of the screen is used to create the Title Page. The Title Page has a set of options along the left-hand side of the screen that include the following:
  - **Title:** Type the title of your story.
  - **Author:** Type the title of your story.
  - **Information:** Write a brief, one sentence synopsis of the story.
  - **Border:** Select from a choice of borders using the Arrow keys.
  - **Color:** Can select the color of the letters and background.
- At the bottom left of the screen are two buttons. One is a trash can for dragging unwanted objects or text off the screen and into the trash. The other is Stop sign which brings you back to the Main Menu and allows you to Exit.

- To create a Title Page, simply click on the Title and follow the prompts. Make up a story title and type it in the box that appears on the screen.
- Next, select the Author by clicking on it with the mouse. Type your name in the box that appears.
- Next, click on Information. Type a brief synopsis in the box that appears.
- Next, select the Border by clicking on it. A selection of borders will appear on the left. Choose the one that you find most pleasing. Click on it and the border will appear on your title page.
- The Color key allows you to change the background color or the text color.
- After creating the Title page, Click on the big Red Arrow Key on the lower right of the screen. The computer will ask you if you want a full text screen or a screen with picture and text. It's more fun to select the Picture & Text option.
- The first thing to do is to select the background scenery of your picture. Click on Scenery on the left-side of the screen. After selecting Scenery, a list of new Options will appear on the left side of the screen. You can choose from Scenery, Objects, Color, Sound, Bigger, Smaller, Flip, or Spell.
- Select Scenery and whole array of different scenes will appear on the bottom of the screen. The top row will fill the background of the screen and the bottom row will fill the foreground of the screen. Mix and match different foregrounds and backgrounds by clicking on each one.
- Select OK after you made your selection. You can also choose the Time of Day for your picture. You can choose from Dawn, Day, Dusk, or Night. Or you can just have a colored background where you can insert objects.
- Clicking on Objects will allow you to choose from People, both ordinary people or mythical people; Animals, both regular and mythical; Nature; Vehicles; Shelter; and Things.
- To place an Object in a picture, click on the Object that appears in the small box on the right of the screen. After clicking, hold the button down and drag the picture into the frame of your picture. Place it where you want and release the button. Now you can make the object bigger, smaller or different colors by simply clicking on the icons on the left side of the screen. To remove the four dots around the object, click in the text box.
- Once your picture is complete. Click in the text box. Begin to write your story. Once the text box is filled, click on the Red Arrow and a new Page will appear. Repeat the whole process until your story is complete.
- **DO NOT SAVE YOUR STORY** on the system. You can save your story on disk.
- You can print your story, but it is a little difficult. Select Printer Setup from the File Menu. In Printer Setup, select the name of the printer that the room uses. You will have to go look at the printer itself to retrieve the name. After selecting the name, close the menu and choose Print. The Print menu will appear. Just click on OK. The story should begin to print, but given all the information on the screen, it will take a long time. I recommend not printing at all.

WOOD CAR RALLY

Age: 8-12 **Grade Level:** 3-8 **Topic:** Force and Motion

Goal: Students learn about force and motion by using wood cars to investigate how car weight, friction/lubrication, car shape, ramp angles, and ramp length influence the distance a car will travel.

To Play: Throughout the program use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape key** to quit in the middle of a program. To turn the sound on/off, press **Control "S"**.

Procedure:

- The Main Menu consists of four options:

1. **Information:** Under information are four different features:
   - **See a Description:** Brief summary of the game. Your goal is to see how five different variables affect the distance a car will travel. The car variables are shape, weight and lubrication. The ramp variables are length and angle. Test each variable at one time. Start causes the car to move down the ramp. Chart stores the settings and results of your experiment.
   - **See a Demonstration:** Shows a brief demo of all the different variables.
   - **Credits and Reference to Manual:** Miscellaneous information.
   - End
2. **Practice Track:** A guided tour of the game where you learn how to control the variables.
3. **Competition Track:** The full game where you are given specific problems to solve.
4. End

- To play, type in your first name, your last name, and select Yes if your name is spelt correctly.

- To begin, first you must choose all your variables. The variables are on the bottom of the screen. Beginning from left to right you select:
  - Car: Choose from Boxy, Racy or Indy. Use Arrow keys to select.
  - Weight (of Car): Choose from 3.5 to 8.5
  - Surface of Ramp: Choose None, Oil, or Graphite
  - Ramp (Length): Choose 2, 4, 6, 8 feet from the bottom of the ramp.
  - Angle (of Ramp): Choose 10, 15, or 20 feet angle.

- After making your selections, select Start (using the Arrow keys). The car will roll down the ramp and the computer will tell you how far it traveled. Select Chart, and

TIMELINER

Age: 5 & Up **Grade Level:** K-12th **Topic:** Social Studies

Goal: Students are able to get a better understanding of history and historical events by plotting significant events along a timeline continuum.

To Play: Press **Enter** to begin game. During the game use **Arrow keys** to choose, the Enter key to select. Press **Escape** key to quit any time during the game.

Procedure:

- **Main Menu** consists of five options: New Time Line, Load a Time Line from Disk, Merge Two Time Lines Together, Erase a Time Line from Disk, Quit. Below is a description of each:

  1. **New Time Line:** Select this to begin the game and create a new time line.
  2. **Load A Time Line from Disk:** Allows you load a previously saved timeline.
  3. **Merge two times together:** Allows you to merge a timeline you created with one already stored in the game.
  4. **Erase a time from disk:** Allows you to delete a previously saved time line.
  5. **Quit.**

- To play, after selecting New Time Line, the computer will ask you if you want your time line to be: one day long, one week long, one year long, many years long, 10 billion years long. After you select a length of period, hit Enter.

- A black screen will appear with the following words on the bottom: Event, Length, Save, Print, Font. Hit the Enter Key to get the additional options: Add, Del, Edit, Main Menu.

- Hit Enter to begin. Use the Spacebar to move between these categories. Select Main Menu if you want to get back to the other options.

- After hitting Enter, the computer will ask for the time of the event. Enter time and hit Enter.

- Then it will ask for a description of the event. Type the description and hit Enter. The event will appear on a timeline.

- Now you can keep adding events, using the same method, until your timeline is complete.

- Hit Escape to return to the Main Menu. The computer will ask you to quit without saving. Select Yes. **DO NOT SAVE GAMES.**

WORD GALLERY

Age: 5-7 **Grade Level:** K-2nd **Topic:** Basic reading skills

Goal: Students develop early reading skills such as capitalization, word recognition, and spelling.

To Play: Throughout this game you will need to use the **Arrow keys** to move and highlight features. Press the **Enter key** to access a particular feature. Press the **Escape key** to quit in the middle of the game. To turn the sound on/off, press **Control "S"**.

Procedure:

- Hit Enter to reach **Main Menu**. There are six games to choose from: F1 - Flashcards, F2 - Matching, F3 - Missing Letters, F4 - Spelling, F5 - Word Guess, Esc - Quit. To play, press the corresponding key. Once inside a game, to escape, press F1 to return to the Main Menu.

- **To play Flashcards**, there are six cards on the screen. By typing the number of each card, the name of the object in the card appears, and the object becomes colorized. Before playing though, press F2 - Options to turn off the sound. Simply type N for None and the sound is turned off. You can also make other changes by simply typing the first letter of each word. When you are done customizing, type D for Done.

- To play **Matching**, you must match the object with the word. When the object appears on the screen, type the number of the word it corresponds to. Complete all five objects. Again, you can customize your game in the same manner describe above.

- To play **Missing Letter**, simply type in the missing letter that corresponds to the object on the screen.

- To play **Spelling**, type in the name of the object that appears on the screen.

- To play **Word Guess**, type in the name of the object that appears on the screen. This game is just like Hangman, only much more simple since you can see the object.

- To escape, just return to the Main Menu by hitting F1 and then hitting the Escape Key.

your results will be recorded. You have the option to print them, but DO NOT PRINT.

- After practicing a while, you can move on to the Competition Track. In this level you have wood car problems to solve. You have 3 chances to create a car that travels the distance given to you by the computer..

- There are 3 levels of play. Select either 1. Easy, 2. Medium, 3. Hard. I suggest easy because this game is hard!

- If you successfully complete your problem, you are rewarded with a title graphic and a little song. Hit Control "S" if the song appears.

- Finally, a menu appears asking you if you want to: 1. Try another problem, 2. Change levels, 3. Return to the Main Menu. You can choose to continue or return to Main Menu where you can then leave the game.

APPENDIX G

STATE '94 Proposal

Preparing Teachers for the 21st Century: Integrating Microcomputers into the Teacher Education Curriculum

The purpose of this presentation is to outline an on-going faculty development technology project in The American University's School of Education. Two members of AU's Teacher Education faculty, the Director of Teacher Education, and an instructor in the Department of Computer Science and Information Systems are promoting computer literacy among the faculty and students and integrating computer technology into selected teacher preparation courses. The need for such a project is dictated not only by the country's major professional education accrediting agencies, e.g., NASDTEC and NCATE, but also by the rapidly changing demands of the American workplace.

Type of Presentation: Panel

Order of Presentations:

New Technology Standards for Training Pre-Service Teachers

Cielle Block, Ph.D.
Director of Teacher Education
The American University

This presenter will outline the new technology standards set forth by the nation's two major professional education accrediting agencies and review what these new standards mean for teacher preparation programs.

Incorporating Microcomputers into "Mathematics for Elementary School Teachers"

Lynn H. Fox, Ph.D.
Assistant Professor of Education
The American University

This presenter will outline the revised Mathematics for Teachers course that includes a technology component. In the revised course, students are required to evaluate software for uses at different grades, explore the uses of spreadsheets for instructional purposes as well as reporting and record keeping functions, and create simple programs to illustrate principles of programming with students.

Bringing Literacy Instruction On-Line: Integrating Technology into Elementary Reading/Language Arts Methods Courses

Deborah L. Thompson, Ph.D.
Assistant Professor of Education
The American University

This presenter will outline the uses of technology in reading/language arts methods courses. In these revised courses, students are required to evaluate software for uses in the reading/writing classroom, use desktop publishing to produce a document, and use Lexis/Nexis to track literacy issues worldwide.

Creating an Automated Multi-Media Retrieval System for Faculty, Staff and Students

B.J. Gleason
Instructor
Computer Science & Information Systems
The American University

This presenter will outline an automated multi-media information retrieval system recently initiated for the faculty, students and staff of the American University's College of Arts and Sciences (of which the School of Education is a part). The kiosk system will serve a variety of functions including upon request class schedules, campus maps, faculty members' office hours and syllabi, and e-mail capabilities.

Method of Presentation

The presentation will be in panel format; however, the panelists will encourage the audience to interact with them during the presentation, as well as, during the scheduled question and answer period. Handouts will also be available.

Panel Members:

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Equipment Needs: Overhead Projector

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APPENDIX H

STATE '94 Proceedings Article

Integrating Technology into Teacher Education: One University's Approach

Lynn H. Fox
The American University

Deborah Thompson
The American University

Computer technology has been front and center in the nation's move toward the 21st century. Yet despite the increased availability of state of the art hardware and a proliferation of educational software, computers are receiving only minimal use in many of the nation's schools. According to the U.S. Office of Technology Assessment (1988), one of the major reasons for the limited impact of computers in schools is that many graduates of education programs do not feel prepared to use them. Recognizing the need to better prepare future teachers, we at The American University have begun to integrate technology into several courses in the pre-service teacher education program. This paper summarizes our approach to this task and the resulting philosophy, goals, and procedures that have been implemented, and it concludes with the objectives we hope to address in the future.

We began with a literature review, seeking standards recommended by agencies such as the National Council for Accreditation of Teacher Education (NCATE) and the National Council of Teachers of Mathematics (NCTM). We then conducted a needs assessment to determine campus computing resources and faculty computer skills.

The review of the literature and standards led us to conclude that it would not be possible to incorporate all the desired goals and objectives in the first year. Therefore, just five goals were chosen, as listed below.

Goal I: Explore, evaluate and use computer and technology-based materials.

Goal II: Demonstrate knowledge of uses of computers for problem solving, data collection, information management, communications, presentations, and decision making.

Goal III: Design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and diverse student populations.

Goal IV: Evaluate, select and integrate technology and computer-based instruction in the curriculum of one's subject area(s) and/or grade levels.

Goal V: Demonstrate skill in using wordprocessing, database, and utility software for professional and personal use.

The University has extensive computer resources, including several special purpose computer laboratories. We selected the Anderson Computing Complex (ACC) for our purposes. The networked Macintosh and IBM compatible computers in the ACC allow students to access the university mainframe for tapping into the library database, sending e-mail, or running software such as Statistical Package for the Social Sciences (SPSS). Liquid Crystal Display panels and overhead projectors are also available in ACC.

Since the networked laboratory setup at Anderson

Computer Complex supports site licenses as well as single station programs, we decided to purchase a variety of software for use there. We purchased site licenses for three programs, five-user lab packs for three programs, and single copies of 20 other programs. Thus we can do demonstrations of single programs using the LCD panel, have all students working with the same program such as *Oregon Trail*, by MECC, or have individual or teams of students working with different software during a single class session.

Wetzel (1993) notes that a combination of a core course in technology and an integration of technology across teacher education courses serves preservice teachers best. Program constraints, however, influenced our decision to incorporate competencies across courses, especially the methods courses, but not require a separate course. Another compelling reason to integrate technology across courses was that prospective teachers should have hands-on experiences within the context of their total teacher education program.

Since all elementary education majors take "Psychology of Education" and "Theories of Reading" at the beginning of their undergraduate elementary programs, the general overview of computers in education and activities related to goals I and II are presented in those classes. The remaining goals are targeted in the methods courses. In these courses, students can meet the objectives in a variety of ways ranging from individual projects to cooperative group projects. They use various software programs in their development of written lesson plans and in micro-teaching demonstrations. Sample activities designed to accomplish each of the five original goals follow:

Goal I. Explore educational software.
Assess available educational software using a 26 item check sheet which covers areas ranging from "user friendliness" to strengths and weaknesses for reading/language arts instruction.

Goal II. Use computers for information management, communications and decision making.
Use spreadsheets to compute grade point averages, class rankings, grade improvement profiles, and graphs for use in parent conferences or PTA presentations.

Goal III. Design and develop learning activities for different settings and/or diverse student needs.
Develop a written lesson plan using a software program for drill and practice in a setting in which there is only one machine in a classroom. For example, how could a teacher use Math Rabbit, by The Learning Company, for individual practice activities?

Goal IV. Integrate computer-based instruction in the curriculum of one's subject area/grade.
Demonstrate or plan a lesson which uses a software program for a small group cooperative learning project. Students working on social studies project about countries in South America might learn how to use various software programs to get information and make maps.

Goal V. Demonstrate skill using computer as a productivity tool.
Use a software program as an administrative tool or to help prepare visual aids for instruction. This could be more work with spreadsheets or learning to do more with word processing and desktop publishing software to generate newsletters, banners, or posters for bulletin boards.

Some goals we consider so important that we incorporate them into several classes. For example, we believe that preservice teachers must become informed users of educational software, therefore in every class students must analyze and select appropriate software. In the course "Teaching Reading in Elementary Education," students are given a 26-item checklist to analyze any of a number of popular reading/language arts programs available in ACC. The checklist covers four major areas: educational value, user friendliness, capabilities, and safe guards. Students have to accept or reject the software based on their checklist answers.

Sometimes several goals can be met in one assignment as is the case in the course "Mathematics for Elementary School Teachers," where goals one, three and four are addressed in one cooperative learning activity. Four teams of students design lesson plans using various software packages. The first team focuses on selecting and using programs for drill and practice. The second team looks for problem-solving or simulation activities for small groups. A third team looks at programs that lend themselves to large group activities for mathematics instruction. A fourth team looks at programs in social studies or science to determine ways of integrating mathematical activities into lessons using those programs. Each team conducts a simulated lesson before fellow classmates who roleplay elementary students. They must address the question of how they would use their programs according to access, i.e., a one computer classroom versus a laboratory with multiple stations.

In the 1993-94 academic year, we have been developing and field-testing lessons and activities in various courses. By 1994-95, we hope to have these activities and assignments fully integrated into the basic courses.

Future Directions

We have already chosen a second set of five goals for future lesson development. Students shall be able to:

Goal I: Demonstrate knowledge of equity, ethical, legal and human issues of computing and technology use as they relate to society and model appropriate behaviors.

Goal II: Demonstrate a functional knowledge of a programming language such as BASIC or Logo.

Goal III: Demonstrate a functional knowledge of telecommunications tools and resources such as electronic mail and the Internet.

Goal IV: Possess knowledge of the configuration of computer hardware systems and basic troubleshooting and maintenance of hardware and software.

Goal V: Demonstrate functional knowledge of multimedia and hypermedia tools and resources.

Conclusion

We believe micro-computers are tools that all prospective teachers need to be able to use with confidence. Computers are such an integral part of today's society that schools cannot afford to have them sit idle or be used infrequently. Schools of Education must take an active role in researching and using this technology and incorporating it into the fundamentals of classroom management and instructional modes. We believe our approach at program-wide integration of behavioral and cognitive objectives in a systematic way is a fundamentally sound approach to making teacher training relevant and creative.

References

U.S. Congress, Office of Technology Assessment. (1988). *Power On! New Tools for Teaching and Learning*. Washington, DC: U.S. Government Printing Office.

Wetzel, K. (1993). Models for achieving computer competencies in pre-service education. *Journal of Computing in Teacher Education*, 2 (4), 4-6.

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APPENDIX I

Article in Preparation

The Oregon Trail: An Interdisciplinary Gold Mine

As teachers push to integrate all areas of the curriculum, they must include computer software that enhances each subject area. One such software package is The Oregon Trail (MECC, 1992), a highly entertaining package that offers teachers myriads of opportunities to integrate reading, language arts, social studies, science, math and the arts. Students using the software engage in real life decision-making, e.g., whether to caulk the wagon and float across the Kansas River or try to ford it. The object is to get five people, a team of oxen, and a wagon load of supplies safely from Independence, Missouri to the Willamette River Valley in Oregon. The pitfalls and life-and-death situations lurk every mile of the trail.

Starting Out

One of the first lessons on the Oregon Trail evolves from the Occupation Help Screen. On this screen the student has to make decisions about the type of settler he/she wants to go west as, e.g. banker, teacher, farmer, etc. The help screen gives the advantages and disadvantages of each occupation. See Table 1 for help screen menu. After selecting the occupation of the leader and naming the party (four others are in the party), participants have to go to the store to purchase supplies: oxen, bullets, clothing, wheels, axles and wagon tongues, and food. (There are a myriad of math lessons on this screen. See other sections for suggestions.) Once the purchases have been made, the participants are ready to travel the trail.

Traveling the Trail with Reading and Writing

Many children have little background for the era in which settlers traveled westward to Oregon and California. To fill that void in their background, there are numerous well-written titles that give students a "feel" for the era and the dangers involved in traveling west. One such book for early readers is Going West (Van Leewun, 1992). In this picture book illustrated by Thomas B. Allen, Hannah, a girl of seven, relates the story of her family's leaving their home in the East and going West. She describes life in a covered wagon, the destructive storms and the raging rivers. The family reaches their destination, some unnamed place in the Great Plains region

of the United States, and Hannah continues the story of her family's first year in their new homestead.

A related picture book , The Way West (Knight, 1993), is based on the actual journal of Amelia Stewart Knight, a pioneer woman who traveled the Oregon Trail with her family in 1853. As students travel the trail, they can record their thoughts in a trail journal and compare them to those of Mrs. Knight's. Students can also authenticate the game by comparing some of the things that happen to them traveling the trail and those things that happened to Mrs. Knight and her family.

An easy chapter book, Pioneer Cat (Hooks, 1983) describes the how a little girl smuggles a stray cat to Oregon. The challenge for Kate is to keep Snuggs the cat from being discovered on the 2,000 mile trek from St. Joseph, Missouri to Oregon. Facing West (Kudlinski, 1994) follows the 2,000 mile trek Ben and his family make from Missouri to the Oregon Territory. Ben is the family journalist. It is his job to record the happenings and sights that occur along the trail. Many harrowing experiences face the family of this 60-party wagon train, and it is begrudgingly that Ben seeks to include great details in his writing after he realizes that simply recording : *The same as yesterday and the day before that* (p. 10), tells nothing of their great trek west.

Bound for Oregon (Van Leeuwen, 1994) is based on the true story of 10 year old Mary Ellen Todd as she and her family leave their Arkansas home, travel to the Independence, Missouri to join a wagon train to Oregon. This book is one of many based on actual primary documents that tell of the joys and sorrows of the country's westward expansion.

The Oregon territories were a place where one could make a fortune but not necessarily find love and companionship. In Bargain Bride (Lampman, 1977), the fifteen year-old heroine has been promised to a man of "means": he has a two-roomed house with a real bed and a cookstove, three times her age. Her marriage had been performed when she was ten years of age. The "bargain" was not fulfilled until the bride came of age. During the time of the settling of the Oregon territories, that age was fifteen, sometimes younger. Lampman's story gives the reader a

sense of the harsh frontier life as well as the rampant prejudice against native Americans that existed among the new settlers as they pushed on toward the Pacific Ocean.

In addition to the titles that give readers a sense of what it was like to travel along the Oregon Trail, there are those that give informative looks at the exploration of the territory by Lewis and Clark. The bibliography has a listing of these titles as well as others related the Westward Movement, of which the migration to the Oregon Territories was a big part.

Linking Mathematics with Social Studies Along the Oregon Trail

The Oregon Trail, particularly the computerized version of the simulation, is an activity that most students find interesting. Played individually or as a group, the program offers many possibilities for planning lessons and/or learning stations that link some of the activities and content about traveling the trail to basic and advanced topics and skills in mathematics. At a fairly basic level of mathematical skills one can create activities related to addition and subtraction using decimals with problems involving money and shopping for supplies for the trip , or activities related to measurement and conversions to and from the metric system with both map activities and "simulated" shopping at a general store. More advanced topics can connect issues in ratio and proportion to problems in scaling for maps and models or uses of formulas and functions in discussions of the relationship of distance to time and rate of travel. In a classroom with access to other computer programs such as spreadsheets and atlas programs activities can bridge to the use of these tools as well. Some specific lesson plan ideas are described in the following sections.

Distance and time then and now

The relationship of distance, time and rate of travel can be taught by induction by providing numerous examples in a chart format and having students deduce the relationships. Students can use maps (road maps provided by automobile club are best) and trace the Oregon Trail with a highlighter using major highways and recording mileage between major cities or landmarks. Have students decide on different average rates of speed between points and calculate

the likely time to travel the trail today. Have students seduced how many stops they will need to make along the way for gas, food, rest, etc. and

recalculate total trip time with these variables included. Compare time today by car to the time it took original travelers in their oxen pulled wagons. For variations you could base the time from historical accounts of the time a typical family took to reach Oregon and using the distance estimate daily rates of travel. One account of this could be taken from (???find a good source for this)Another way to look at the travel times in the wagons is to have students record their mileage each day on the trail in a travel log as they use the computer program. Calculate the rate of travel using only the days they were on the trail and moving forward and again including days they rested or were delayed or lost. In the discussions of modern travel some students may mention other ways of traveling today, if not the teacher can raise the issue. Students can call different airlines and get route and time information to compare to car travel. If one wanted to "push the limits" one could try to get information on other methods such as hot air balloon and try to incorporate ideas about wind direction land velocity as an aid or barrier to travel, indeed discussion of traveling by airplane can talk about tailwind time differences in flying east or west along the trail.

Extensions to the unit lessons using spreadsheets or calculators. If one has access to a spreadsheet program , students could enter their information in charts and let the computer run the calculations for each leg of the trip by various modes: car, plane, wagon, etc. Or use hand drawn charts and a hand-held calculator to perform or check calculations. A sample spreadsheet is shown in figure a.

An extension of the unit lessons using map making activities. Also students can learn about proportion and ratio by drawing maps to scale or working with measuring maps and using map legends to calculate distances. Mileage can be converted to metro measure and map legends devised to reflect both miles and kilometers for conversion. Map activities can be used to introduce some artistic project options for some or all students. Atlases or computerized atlas programs such as PCUSA are available which could be used to generate maps of specific states

or regions Atlas work would allow for expansion to other topics in geography that have a numerical basis One could look at different elevations at different points along the trail and chart those against other information such as average rainfall or average temperatures Again a spreadsheet approach, especially an electronic spreadsheet, would allow one to look for patterns and relationships among the different climate and terrain variables Indeed a link from the travel on the rail to science might be make with a discussion of weather conditions along the trail at different times of the year and the relationship of those factors to problems students encountered in the simulations such as draught, lack of grazing grass for animals, and diseases that the traveler's sometimes encountered such as dysentery and cholera

An extension of the unit lesson using model making An additional activity that could be introduced that combines measurement, scaling and art is the creation of models of the wagons , one of the forts along the way, or a river and ferry crossing The later could be done with real water and wave action to add more challenging problems of the crossing of the river and the spot of landing as a result of river currents

Shopping along the Oregon Trail

One of the easiest lessons to derive from the Oregon Trail activity would be to create a country store of the era and use old fashioned and modern scales for measuring and weighting products such as flour . One could take a shopping list from the days of the settlers and try to convert it a more modern day equivalent and bring in grocery store advertisements for comparison pricing. One could price the cost of food today if a family of five traveled the trial in a reenactment in a wagon. Alternatives would be to determine amounts and costs of materials to put together a dinner for five then and now. If space and facilities are available one might have students cook a meal using old-fashioned recipes . Depending on the specific mathematics skills to be practiced or introduced one could add activities involving conversions to metric measure for milk and flour, etc. Students could role play being cashier/storekeeper versus traveler and work on adding up shopping bill and making change, adding tax or discounts, using coupons with discounts and so forth. Simulations could range from the simple with worksheet to fairly

elaborate such as creating a life-size country store model depending on how much time can be devoted to shopping and measuring activities. Fro example, a learning station could be created to resemble a general store with empty containers labeled with old fashioned prices, a calculator with tape could be used for the cash register and play money could be used to simulate sales. Measuring cups, spoons and scales could be available with "fake" food. A less ambitious project could involve temporary set ups of groups of students to form families for the trip with a calculator and a "newspaper add for food prices in the days of the settlers" and shopping guidelines could be given and family budgets specified. A variation could be to have a game where families could earn opportunities to pick wild berries along the trail or hunt for deer and rabbits by solving math problems related to the tasks. Some sample problems might be as follows:

> If the average berry weighs ? and a quart of berries is needed to make a pie. How many berries will your family need to pick to get a quart? You submit your answer to a berry patch attendant and if correct you receive the quart of berries.

Logic puzzles could also be adapted to the trail theme, for example the following problem could be given:

> (the container problem of pouring out liquid look in math puzzle book for examples)

Shopping simulations can also be used to introduce or practice skills and concepts related to fractions. Some sample problems are as follows:

If a buffalo is shot and has 200 lb. of edible meat, and there are five people in your wagon what fraction of the buffalo could each person have, how many pounds would this be.? (IF you worry about vegetarians you could focus problems on dividing barrels of water into other containers or tubs of butter or sacks of flour and sugar could be divided into smaller containers, etc.

> If you start out with 2 yokes of oxen and one dies what fraction of the oxen died ? What percent died?

Cooking activities real or simulated could be used. For example, students could Multiply fractions or divide them when one takes a recipe for "Oregon Stew" and tries to triple it for three wagons of families or divide a recipe meant to feed a dozen into one better suited for a family of four.

Of course need not have the computer version of Oregon Trail to do any of the above activities. Students could learn about the Oregon Trail in any number of different ways, including the board game version or by reading "???" IF a computer lab is available to let students or pairs or triplets of students work through the simulation it is both motivating and challenging in terms of problem solving. You can keep students on task be having them be kiting a log as suggested to record miles traveled per day. They could also tack their food usage and loss and gain of supplies. Create rewards for completing the trail without loosing any lives. Invoke penalties for "over-shooting" more meat than a wagon can carry. More complex issues can be raised by using the networked version in which students travel in wagon trains of nine wagons. Here issues of democracy and leadership can be entwined with the lessons in history, science, mathematics and language arts.

Thematic teaching and the integration of skills , concepts and information from different areas does not require a computer simulation program such as Oregon Trial. Lessons which can incorporate such technology, however, are likely to be enhanced by their use. They provide visual stimulation and the excitement of a gamesmanship to motivate student participation. Although the program could e used for large group instruction with a hookup to a large monitor, it is probably more appealing when played in teams of two or three players who can spend more time talking and problem-solving together. Because there can be great variability in how long it takes a team to complete a crossing, it is important to have the capacity to save the program and name it for later recall. Some groups may need to use before or after school time or recess time to complete the crossing. Ideally one should have the resources of a lab with at least five machines available at a given time to support a whole class working on the program together or in shifts. If shifts are needed, it is nice to have the learning stations such as a model country store

available and /or simultaneous on-going work on projects such as map making, model construction, and journal writing

A culminating activity or one that could be on-going throughout the Oregon Trail Unity is the creation of the Trail Blazers newspaper. The mathematical parts could be incorporated in weather forecasting and reporting with charts and graphs, inclusion of maps and discussions of "possible short cut routes being blazed>" Articles could tell about how to quadruple a recipe or cut it in half and discuss the price of flour and eggs at various different points along the trail. A typical family budget and list of expenditures for the trip could be included in an article for the newspaper

APPENDIX J

BELL ATLANTIC Proposal

KK039405
Kirby
Restricted

THE AMERICAN UNIVERSITY

SEND NOTICE OF AWARD TO

Office of Research Services
The American University
4400 Massachusetts Avenue
Washington, DC 20016
202-885-3440

AGENCY DEADLINE
(DO NOT LEAVE BLANK)

Date March 24, 1994
☐ postmark ☒ receipt

ESTIMATED AWARD DATE

Date May 30, 1994

SPONSORED PROGRAMS APPROVAL FORM

Title of Proposal: Technology in The Public Schools

Prospective Sponsor: Bell Atlantic Foundation/Bell Atlantic Mobile Systems

SUBMISSION TYPE	TYPE OF PROGRAM
☒ Preapplication	☒ Grant
☐ New	☐ Contract
☐ Renewal	☐ Purchase Order
☐ Continuation	☐ Cooperative Agreement
☐ Supplemental	☐ Memo of Understanding
☐ Revised	☐ IPA
☐ Revised Budget	

CATEGORY	SITE
☒ Research	☐ On Campus
☐ Training	☒ Off Campus
☐ Other	

Principal Investigator: Deborah Thompson
Teaching Unit/College: SOE
Project Duration: From 6 / 1 / 94 To: 8 / 31 / 95

	SPONSOR AMOUNT REQUESTED	TAU COST SHARING
Direct	$ 49,608	$ 15,582
Indirect	$ 13,394	$ 4,207
Fee	$	$
TOTAL	$ 63,002	$ 19,789

DOES THE PROJECT INVOLVE:	YES	NO
a. Human subjects	☐	☒
b. Animal subjects	☐	☒
c. Radioactive materials	☐	☒
d. Toxic materials	☐	☒
e. Subcontracts	☐	☒
f. Research affiliation agreement	☐	☒
g. New personnel	☐	☒
h. Graduate Fellows or Assistants	☐	☒

	YES	NO	N/A
Have computer costs been cleared with Computer Services?	☐	☐	☒
Have equipment costs been cleared with the Purchasing Office?	☐	☐	☒
Have publishing costs been cleared with the Publishing Office?	☐	☐	☒
Does this project involve proprietary data, copyrights or patents?	☐	☐	☒
If sponsor is a private entity, has submission been cleared with the Office of Development?	☒	☐	☐
Has the cost of remitted tuition for graduate fellowships/ assistantships been included?	☐	☐	☒

Availability of adequately equipped space has been approved by:
How will any additional space required be provided:
Describe necessary facilities and space yet to be acquired:

BEST COPY AVAILABLE

(1) Principal Investigator: Deborah L Thompson 3/28/94 Date
Deborah Thompson

(2) Teaching Unit Head: Myra Sadker 3/28/94 Date
Myra Sadker

(3) Dean of School/College: 4/6/94 Date
Kathleen Kennedy-Corey

(4) Director, Office of Research: David Cudlip (See attached sheet) Date

(5) Other as required: Anita La Salle 4/4/94 Date
Anita La Salle

(6) Other as required: Ivy E Broder 4/6/94 Date
Ivy E. Broder

.rby
:stricted

THE AMERICAN UNIVERSITY

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☐ Revised	☐ IPA
☐ Revised Budget	

CATEGORY	SITE
☒ Research	☐ On Campus
☐ Training	☒ Off Campus
☐ Other	

Principal Investigator: Deborah Thompson
Teaching Unit/College: SOE
Project Duration: From 6 / 1 / 94 To: 8 / 31 / 95

	SPONSOR AMOUNT REQUESTED	TAU COST SHARING
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Indirect	$ 13,394	$ 4,207
Fee	$	$
TOTAL	$ 63,002	$ 19,789

DOES THE PROJECT INVOLVE:	YES	NO
a. Human subjects	☐	☒
b. Animal subjects	☐	☒
c. Radioactive materials	☐	☒
d. Toxic materials	☐	☒
e. Subcontracts	☐	☒
f. Research affiliation agreement	☐	☒
g. New personnel	☐	☒
h. Graduate Fellows or Assistants	☐	☒

	YES	NO	N/A
Have computer costs been cleared with Computer Services?	☐	☐	☒
Have equipment costs been cleared with the Purchasing Office?	☐	☐	☒
Have publishing costs been cleared with the Publishing Office?	☐	☐	☒
Does this project involve proprietary data, copyrights or patents?	☐	☐	☒
If sponsor is a private entity, has submission been cleared with the Office of Development?	☒	☐	☐
Has the cost of remitted tuition for graduate fellowships/ assistantships been included?	☐	☐	☒

Availability of adequately equipped space has been approved by:
How will any additional space required be provided:
Describe necessary facilities and space yet to be acquired:

Deborah L Thompson 3/28/94
(1) Principal Investigator Deborah Thompson Date

Myra Sadker 3/28/94
(2) Teaching Unit Head Myra Sadker Date

(3) Dean of School/College Date
Kathleen Kennedy-Corey

(4) Director, Office of Research Date

(5) Other as required Date
Anita La Salle

(6) Other as required Date
Ivy E. Broder

INDIRECT COST ANALYSIS

ALLOWABLE INDIRECT COSTS ON SPONSOR MODIFIED TOTAL DIRECT COSTS (MTDC) FOR THIS TYPE OF PROJECT:	$ 13,394	27 %
INDIRECT COSTS REQUESTED OF SPONSOR FOR THIS PROJECT:	$ 13,394	27 %
INDIRECT COSTS ON SPONSOR MTDC WAIVED BY TAU FOR THIS PROJECT:	$ 0	0 % POINTS

SPONSOR PROHIBITION/RATE LIMITATION MUST BE ATTACHED (IPA's HAVE NO INDIRECT COSTS): ALL WAIVERS (EXCEPT IPA'S) MUST BE APPROVED IN ADVANCE BY THE PROVOST/VICE PRESIDENT FOR ACADEMIC AFFAIRS OR THE DEAN OF FACULTIES. ANY WAIVER OF INDIRECT COSTS IS A COST SHARE.

COST SHARING ANALYSIS

OBJECT CODE DESCRIPTION	VOLUNTARY OR MANDATORY V	M	CASH OUTLAY OR INTERNAL COST CO	IC	AMOUNT	PROVIDED BY 1) ORS 2) COLLEGE/SCHOOL 3) TEACHING UNIT 4) OTHER
AY Salary for SOE/CSIS						
Faculty	x			x	12,269	3) Teaching Unit
Fringe on above	x			x	3,313	3) Teaching Unit
Indirect on TAU Base	x			x	4,207	1)ORS Indirect on contributed base
TOTAL COST SHARING					19,789	

TOTAL COST SHARE VOLUNTARY $ 19,789 TOTAL COST SHARE MANDATORY $ 0

TOTAL COST SHARE INTERNAL TRANSFER $ 19,789 TOTAL COST SHARE CASH OUTLAY $ 0

NEW PERSONNEL N/A

Complete the following information for all **new** personnel to be hired from funds provided by this project

POSITION	STATUS (Full or Part-Time)	DURATION: From/To

(Note: full-time = minimum 28 hrs/week for 10 months. Sponsored Program personnel appointments have a cumulative effect on full-time status. Position descriptions should be attached for all new full-time positions. If new full-time personnel are named in the proposal, affirmative action/EEO policies of the University must be applied; written rationales for exception to University EEO policies must be attached. The Principal Investigator is responsible for initiating all personnel actions.)

OVERLOAD N/A

Complete the following information for all overload situations on this project

NAME	TIME PERIOD	%TIME	$ AMOUNT	JUSTIFICATION

(Note: Overload situations are approved only in special circumstances and are always subject to approval within University guidelines.)

COURSE RELEASE N/A

Complete the following information for all full-time faculty course releases for this project

NAME	SEMESTER	# COURSE RELEASES	REPLACEMENT REQUIRED? (Adjunct or Temporary?)

COLLEGE/TEACHING UNIT IMPLICATIONS N/A

How will teaching unit replacement cost be funded? _____

Are these new funds? _____

How will other college/teaching unit cost share object codes be funded? _____

_____

Are these new funds? _____

EQUIPMENT Requested from Bell Atlantic rather than purchased. Also requesting installation, maint., training assistance.

Describe new equipment to be purchased for this project: 4 Cellular phones, 4 Laptop Computers, 4 Modems, 4 projectors, 1 camera, 2 video editing machines

Who retains control of new equipment after project termination? TBD

How will new equipment be maintained after project termination? TBD

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THE AMERICAN UNIVERSITY
WASHINGTON DC

March 14, 1994

Mr. Jim McHenry
Bell Atlantic Mobile Systems
180 Washington Valley Road
Bedminster, New Jersey 07921

Dear Mr. McHenry:

In response to our meeting last December, we have put together a brief description of the project we discussed.

As we all know, modern information technology has transformed the workplace by allowing interaction among a variety of information resources via electronics, but there has been no such transformation in the classroom. While many middle-income students have opportunities to use this technology in the home, there are few such outlets for poor students. Which makes it all the more important for schools which service poor students to have this technology. At this time, few schools that service poor students have the financial resources to buy and secure the equipment.

In a joint effort of the School of Education, the Department of Biology and the Department of Computer Science and Information Systems at The American University (TAU) and the District of Columbia Public Schools, we propose to develop a program for the AU student teachers that will enable them to make the best possible use of new telephone technology in their classrooms. We already have established a partnership with a local elementary school at which we plan to develop and field test lesson plans that incorporate the new technology. Other important aspects of the program are:

- use of e-mail as a tool to further literacy development
- on-line links between schools and professionals in various fields, e.g., scientists at the Agricultural Research Center who have expressed an interest in such a project

Mobile phones in the classroom have limitless uses. For example, mobile phones allow many teachers access to technology from any classroom in the school, something that would be impossible with land-based equipment. Also mobile phones and modems allow students to work on projects--science, art, social studies, etc.,--off the school site. On field trips, teachers could remain in constant contact with the building (especially helpful in case of emergencies or delays in returning to school.).

School of Education

4400 Massachusetts Avenue, N.W., Washington, D.C. 20016-8030 (202) 885-3720 Fax: (202) 885-1187

We expect that the graduates of the program will bring a degree of enthusiasm for the use of these tools to their teaching jobs, and will influence the schools and systems to which they go to consider the uses of this technology.

We are excited about the project and about the collaboration potential with Bell Atlantic Mobile Systems. The possibilities for this innovative partnership are endless. We look forward to hearing from you.

Sincerely,

Deborah L. Thompson
Assistant Professor

Lynn H. Fox
Assistant Professor

George Loeb
Research Professor

Bell Atlantic
Budget Narrative

Personnel

Salary estimates include annual merit raises, which are not guaranteed. For purposes of budgeting, full-time faculty salaries reflect a 5% increase on January 16 of each year, and full-time staff salaries reflect a 5% increase on January 1 of each year. Salary increases are estimates only and will be paid in accordance with established university policies. Only actual rates will be billed.

Fringe Benefits

Fringe benefits are 27% of full-time salaries and 8% of part-time salaries. Faculty are considered part-time in the summer.

Indirect Costs

The University's full indirect cost rate as a percentage of Modified Total Direct Cost (MTDC) is applied in accordance with the effective Indirect Rate Agreement negotiated with the Department of Health and Human Services, the University's cognizant auditing agency.

Equipment Request
Bell Atlantic
Technology in the Public Schools
June 1, 1994 - May 31, 1995

I. EQUIPMENT

A. 4 Cellular Phones

B. 4 Laptop Computers

C. 4 Modems

D. 4 Projectors

E. 1 Camera

F. 2 Video Editing Machines

II. TECHNICAL SUPPORT FOR EQUIPMENT

A. Installation of Equipment

B. Training in use of Equipment

C. Equipment Maintanance for duration of grant

D. Cellular phone time

D. Supplies		$300
E. Travel		$50
	Subtotal Other Direct Costs	$950
IV. TOTAL DIRECT COSTS		$18,230
V. INDIRECT COSTS @	27%	
Base: $18,230		$4,922
VI. TOTAL PROJECT COSTS		$23,152

The American University
College of Arts and Sciences
Technology in the Public Schools
June 1, 1995 - August 31, 1995
Year Two

I. PERSONNEL	Sponsor	TAU
A. Principal Investigator		
Deborah Thompson		
1. 6/1/95 - 8/31/95		
	$4,000	in-kind
B. Project Co-Director		
Lynn Fox		
1. 6/1/95 - 8/31/95		
	$4,000	in-kind
C. Project Co-Director		
George Loeb		
1. 6/1/95 - 8/31/95		
	$4,000	
D. Project Assistant		
B.J. Gleason		
1. 6/1/95 - 8/31/95		
	$4,000	in-kind
Subtotal Personnel	$16,000	
II. FRINGE BENEFITS		
A. 8% of FT Salaries for sponsor		
Base: $16,000	$1,280	
Subtotal Fringe Benefits	$1,280	
III. OTHER DIRECT COSTS		
A. Xeroxing	$200	
B. Postage	$200	
C. Telephone	$200	

3. 1/15/95 - 5/31/95			
			$2,071
	Subtotal Personnel	$26,353	$12,269
II. FRINGE BENEFITS			
A.	27% of FT Salaries for sponsor		
Base:	$10,354	$2,795	
	27% of FT Salaries for TAU		
Base:	$12,269		$3,313
B.	8% of PT Salaries		
Base:	$15,999	$1,280	
	Subtotal Fringe Benefits	$4,075	$3,313
III. OTHER DIRECT COSTS			
A. Xeroxing		$200	
B. Postage		$200	
C. Telephone		$200	
D. Supplies		$300	
E. Travel		$50	
	Subtotal Other Direct Costs	$950	
IV. TOTAL DIRECT COSTS		$31,378	$15,582
V. INDIRECT COSTS @	27%		
Base:	$31,378	$8,472	$4,207
VI. TOTAL PROJECT COSTS		$39,850	$19,789

The American University
College of Arts and Sciences
Technology in the Public Schools
June 1, 1994 - May 31, 1995
Year One

I. PERSONNEL	Sponsor	TAU
A. Principal Investigator		
Deborah Thompson		
1. 6/1/94 - 8/31/94		
	$4,000	in-kind
2. 9/1/94 - 1/14/95		
		$1,988
3. 1/15/95 - 5/31/95		
		$2,087
B. Project Co-Director		
Lynn Fox		
1. 6/1/94 - 8/31/94		
	$4,000	in-kind
2. 9/1/94 - 1/14/95		
		$2,025
3. 1/15/95 - 5/31/95		
		$2,126
C. Project Co-Director		
George Loeb		
1. 6/1/94 - 8/31/94		
	$4,000	
2. 9/1/94 - 1/14/95		
	$5,051	
3. 1/15/95 - 5/31/95		
	$5,303	
D. Project Assistant		
B.J. Gleason		
1. 6/1/94 - 8/31/94		
	$4,000	in-kind
2. 9/1/94 - 1/14/95		
		$1,973

Murch Elementary School
36th between Ellicott and Davenport Streets, N.W.
Washington, DC 20008

SCHOOL PROFILE*

Enrollment: 487

Grades: Pre-Kindergarten through 6

Classroom Teachers: 18

Resource and Support Staff: 14

Grouping: Heterogeneous

School Tenure in the Community: 64 years

Experience of the Teachers by Service Years (as of 1991-1992):

- 5 or fewer years--13
- 5 to 10 years--5
- 10 to 20 years--6
- 20+ years--8

Class Pupil Ratio: K-22:1, Primary-25:1, Intermediate-25:1 (Average)

Special Feature: Only District public school with parallel scheduling model. First public elementary school to engage in Middle States Accreditation process.

Principal: Mary H. Gill

Named for: Ben W. Murch, former teacher, principal and area superintendent (1908-1927).

Founded: 1930

*Some of the statistics cited in this profile are from the 1991-1992 academic year.

I. **Spring 1994**

In this stage we will consult with a faculty member and graduate student in computer science and outline the objectives and goals for the student teaching. We will also begin to work with two to four teachers at Murch Elementary School, a public school in the District of Columbia that has a partnership arrangement with The American University (TAU). A description of Murch is attached.

II. **Summer 1994**

Begin developing lessons and testing them with teachers at Murch. Some sample lesson ideas are:

1. Use e-mail to have students at Murch communicate with students at other schools in Montgomery or Fairfax School Systems that have e-mail going through the TAU computer center e-mail system from a modem. Students would become electronic pen pals.
2. Use the modem to access various databases through internet for a mathematics lesson on statistics, or social studies.
3. Use e-mail to request information from experts. For example the Agricultural Research Center at Beltsville, Md is interested in working with us to put scientists in touch with children on various environmental issues. We might plan a field trip to the center preceded and followed by communication on e-mail. The cellular phone might also serve an administrative purpose as it can accompany the children on the their field trip and allow the teacher to keep in touch with the home school.

III. **Fall 1995**

TAU offers several programs to train teachers that are certified. For example, at the graduate level there is a Masters of Arts in Teaching and a Masters of Arts in Elementary Education. Typically the student spends their last semester in a school as a student teacher under the supervision of a regular classroom teacher. This is usually done in the Spring semester. In the preceding Fall semester students take several courses called Practicum courses in which they develop lesson plans and spend a few days in the school each week during the second half of the semester. During this time they can try out several lesson plans. At least one lesson in the field could involve the cellular phone and computer. Between two and four students might be chosen to use the equipment in the field.

The work with teachers at Murch would be continued. Some lessons with teachers and students will be video-taped.

IV. **Spring 1995**

Students in Masters of Arts in Teaching and Masters of Arts in Elementary Education will take equipment with them for student teaching semester in the schools (rotate equipment among those who developed lessons in the Fall semester). Arrangements will be made to videotape the lessons.

Continue to work with teachers at Murch.

Compile a collection of all the lessons that were developed and used and evaluate them.

V. **Summer 1995**
Evaluation and planning for the future

Staff

I. Principal Investigator--Deborah Thompson
II. Co-directors Deborah Thompson, George Loeb and Lynn Fox
III. Two to four Murch teachers

Equipment needs:

Spring and Summer 1994: 2 Lap top computers, two cellular phones and two projectors for the lap tops

Fall 1994 and Spring 1995: 2 additional lap top computers, two additional cellular phones and two additional projectors

Other budget needs:

I. Summer salary: Thompson, Loeb and Fox
II. Salary: Loeb, Fall and Spring
III. Air time for cellular phones:
2 phones spring and summer 1994
4 phones fall 1994 and spring 1995

University contributions:

I. Fox and Thompson research time Fall 1994 and Spring 1995
II. Computer time for e-mail, internet, etc., for the project